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The Business of Railway Transportation

Traffic – Rates – Regulation

By

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PREFACE

This volume discusses the railway business primarily from the standpoint of the consumer of railway freight service—the shipper. It gives careful consideration also to the relation between the railway and the public.

The aim is to present a practical discussion of those matters pertaining to the railway business which particularly concern shippers and traffic men while keeping in mind also the interests of the investor on the one hand and on the other hand those of the thoughtful citizen who desires a right relation between carrier, shipper, and the general public.

The first section of the volume is given to a general description and analysis of the railway business. After a brief presentation of the importance of transportation and the nature of the railway machine, chapters on the internal organization of a railway, on railway accounts, and on statistics, supply a foundation for an understanding of railway operation and traffic problems. They are followed, in the second section, by an extensive discussion of railway geography, and a description of the operating and traffic conditions which affect the various geographical groups of carriers.

The treatment of railway rates, which is in two parts, fills the third and fourth sections. There is, first, a statement of the principles of rate making and a discussion of the demand for and supply of transportation as affecting the value of the transportation service. This is followed by a description of rate making in practice which takes up the classification of commodities for rate-making purposes and the rate structures which have been built up in representative rate territories.

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The fifth section deals with various traffic matters, such as the shipping of freight, reconsignment, demurrage, freight claims, and the terminal problem.

The final section of the volume, dealing with railway regulation, considers the present-day relations between railways and the government. In these chapters the great issues of railway consolidation and of railway labor are taken up. The discussion ends with an appraisal of government ownership, considered as a program proposed for adoption by such a government as the United States.

By solving the problems in the appendix, the student will be led to form business judgments similar to those required in practical dealings with the railway business.

As the subject of railway transportation is so extensive and many-sided, it has been necessary to hold rigidly to certain limitations to make room for adequate treatment of those problems in traffic, rates, and present-day government policy, which particularly concern those who have or plan to have business dealings with railways.

It is believed that the approach here taken has definite advantages, particularly for students in universities or elsewhere whose personal acquaintance with the railway business is but slight. By steering a middle course between the purely theoretical treatise and the merely descriptive works on traffic and rates, it is believed that the study of transportation may be rendered at the same time more interesting and of more practical value. Greater knowledge of railway operating and traffic problems and the business aspects of railway transportation, should lead to a truer appreciation of transportation economics and keener interest in railway history. Fuller appreciation of the relation of railways to industry and trade should bring, on the one hand, a better utilization of railway facilities; on the other hand, a more intelligent attitude toward railway problems affecting the public.

It seems reasonable to say that before one attempts to decide how railways should be regulated, one must have a knowledge of the economics of their operation and the problems which confront them. The railway business is one of the largest and most important businesses in the country. Unfortunately, the conditions of its organization and operation are far too little known to the public.

Moreover, it has come to be so entangled in political controversy that many people have lost sight of the fact that it *is* a business, subject to economic laws. If the American people want to have railways constructed and operated in such a way as to insure a supply of transportation service when and where it is needed, rates must be so made on each class of traffic that the expense of transportation will be defrayed from revenue with something left over for interest on the investment and profit for the business enterprise of the carrier. If railways are constructed on the basis of political pressure, or if rates are made to "aid" different classes or various sections of the country, economic considerations are abandoned and railroading ceases to be a business.

LEWIS H. HANEY

New York City,
March 1, 1924.

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Part I—Organization and Functions of a Railway

CHAPTER I

NATURE AND IMPORTANCE OF RAILWAY TRANSPORTATION

"Transportation" Defined.—Transportation means the regular movement of goods or persons from one point to another by some system of conveyance operating on a large scale. This movement of goods or persons is conducted in such a way as to increase the utility of things by carrying them to places where they are wanted more than at the point of origin. Usually, transportation is carried on for the purpose of making a gain. This means that it is usually a business operation. In any case, the means of transportation, such as railways and steamship lines, are a part of the great machinery of production by which both the wealth and the welfare of the world are increased.

It is, perhaps, not obvious why "transportation" should be limited to the regular movement of things on a large scale. A moment's thought, however, will show that the term has come to apply to the more highly organized processes of the present industrial world, and just as "manufacture" no longer means making things by hand, so transportation no longer means carriage by pack animal or any irregular or unsystematic movement. The transportation agencies which invite our study hold themselves out to carry goods or persons at regular intervals and in such quantities or numbers as may be offered.

Supply and Demand Aspects.—Transportation has two sides: first, the performance, or act of carriage; second, the service. The former is the supply side of transportation. It is concerned with the expenditure of energy, with mechanical devices, and with cost. Its problems are technical. The service, however, is primarily an economic or social matter. It is the basis of demand for transportation; the service is what is wanted by the shipper and the passenger. It is what is bought and sold, as "ton-miles" or "passenger-miles."[1] Engineering and management deal chiefly with performance; traffic and rate policies are concerned with service. The two aspects, however, are interrelated, much as are supply and demand.

Factors in Transportation Efficiency.—Perhaps all limitations on human life can be reduced to terms of space and time. It is distance and the relentless passage of minutes, hours, or days, which prevent us from achieving our desires. Transportation agencies are one of the most important means of overcoming these limitations, and the railway and the steamship both "annihilate distance" and save time.

The tests of railway efficiency can best be put in terms of the foregoing accomplishments. The primary purpose in building railways is to overcome *distance,* and if we could leave out time, the amount of transportation would be a mere question of miles. But in addition to mileage, we have to consider the *speed* and the *quality* of transportation, to say nothing of *economy.* In reality, the quantity of transportation produced depends largely on the rate of speed, that is, on a combination of distance and time. It is said that increasing by one mile the distance traveled by each freight-car per day would be equivalent to adding 100,000 cars to the nation's equipment. But no matter how fast or how far the haul, there could be no final test of efficiency without taking into consideration the quality of the service and the economy of the performance. Quality has to do with convenience and security; while economy concerns the relation of the cost to the utility gained. Other tests of railway efficiency lie in the *regularity* and the *continuity* of the service. Thus, we conclude that, in the most ultimate and simple terms, there are six factors in transportation efficiency: (1) distance overcome, (2) speed, (3) regularity, (4) frequency, (5) quality, (6) economy.

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[1] For definition of these terms see page 53 and in Glossary.

General Advantages of Transportation.—Obviously, the two great general advantages of improved transportation are a reduction in the energy required for conveyance and in the time elapsing between the point of origin and the point of destination. These things, for example, make possible the wider use of perishable commodities, such as fruits and milk, and allow a closer and more continuous contact among widely separated communities. The first of these general advantages has to do with what economists call "place utility," for it is by reducing the cost of hauling that the expense of the commodity delivered to the destination point is brought down to the level of the pocketbook of the prospective consumer. This makes it possible for the commodity to gain utility by changing place. The other general advantage results in "time utility," inasmuch as the availability of goods *when* they are wanted greatly increases their utility.

Special Advantages.—But aside from these broader aspects of transportation advantage, a large number of more special advantages might be pointed out. Among the more important of these are the following:

Improved transportation has developed *broader markets,* leading to the diversification of wants and satisfactions. Raw materials are assembled from the ends of the earth and finished products are as widely distributed, both by means of improved transportation. In fact, the railway and the steamship line are the instruments of exchange and are in that sense similar to money. It will be remembered that Adam Smith likened money to a great way through the air which facilitates exchange by eliminating friction. Similarly, we can say that the great ways of transportation, by reducing the friction of conveyance, facilitate exchange. Both money and railways are instruments which facilitate marketing.

By transportation, *division of labor* is increased. This applies both to occupational division of labor, which brings specialization in trades and professions, and to territorial division, with its localization of industries at most economical points. When men can count on regular supplies of necessities made by others, and can, by the same token, secure a continuous movement for their own products, they can then specialize. It is by means of extensive transportation improvements, both by rail and water, that the great steel industry of the Pittsburgh district can assemble the supplies of coal, ore, and limestone, secure its food supplies from the West, and at the same time deliver its products the world over. Thus transportation facilitates localization.

Transportation has an important effect on the distribution of wealth. It affects the sharing of wealth among the classes known as laborers, capitalists, and land owners. By reducing congestion in cities and giving labor more power to move about in search of better employment, transportation tends to maintain a higher level of money wages; while at the same time, it tends to keep down the cost of food and other necessaries, thus raising "real wages." Many railways maintain immigration bureaus which are effective in mobilizing labor and transferring it to the more sparsely settled regions.

In much the same way, transportation development tends to equalize land rents, for it reduces the disadvantage of location of remote places and decreases the strategic dominance of the more central locations. A new railway raises the value of adjacent farm land, while, by opening up suburbs to commuters, city rents are reduced. No doubt, interest rates are equalized in a similar manner. In short, by making labor and capital more mobile and by making agricultural development more uniform,[2] development of transportation tends to prevent both local congestion and overproduction, and local underdevelopment and scarcity. This tendency helps to secure a maximum production as well as a more equitable distribution of wealth.

Social Effect.—The broader social and political effects of improved transportation should also be noted. Notable among these is the relation of transportation to that concentration of population in cities which is so striking a phenomenon in present-day life. Transportation both makes this possible and alleviates the hardships which result from it. It is said that the produce of 50 acres of land is required to support one man living in a city. If this be true, a city having a population of 5,000,000, of which 2,000,000 were adults, would require the service of 100,000,000 acres. Greater New York, together with Jersey City, Hoboken, and Bayonne, had in 1920 a population of over 6,103,000, which enormous aggregation could only be fed and clothed through the continuous operation of a vast network of railways and waterways. At the same time, the population of this congested area is as widely diffused as possible by means of electric and steam lines. Each week-day morning in the year over 300,000 "commuters," mostly adults, pour into Greater New York from within a radius of approximately 50 miles from the center of Manhattan; and each evening they return to their homes in the country and small towns from which they came.

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[2] Equalizing intensity of cultivation and keeping up the margin of cultivation.

The effect of rapid and continuous transportation upon social intercourse within a country is vital. It helps to produce social solidarity and a uniformity in customs which is very different from the localism of earlier days.

Political Effects.—Politically, transportation is all-important. In the first place, it makes possible the effective internal policing of a nation, enabling the government to intervene and quell local disturbances or safeguard local property rights. In the second place, it is a vital adjunct in external defense, being an essential to military strategy and to the effective functioning of commissary and hospital operations. One only has to recall the effectiveness of the German transportation service and the weakness of the Russian in the World War to appreciate the full force of this point. It was largely this realization that led to the temporary nationalization of the railways in the United States. In the third place, the political importance of effective intercommunication among sections of a country should be remembered. The history of the United States furnishes many illustrations of this, among which may be mentioned the service of the earlier roads and canals in preventing the growth of a separate nation west of the Alleghenies, and later on, the effectiveness of the Pacific railways in binding the Pacific Coast section to the nation. Transportation has played a vital part in determining national solidarity in many nations and times.

Transportation as a Public Utility.—It is interesting to reflect that transportation, and notably the railway, aids both differentiation and integration. On the one hand, it makes possible division of labor and local specialization, while on the other hand it binds together the various divisions and localities through a system of exchange and informal cooperation.

Such being the case, it is little wonder that the agencies of transportation have come to be thought of as "public utilities" and are commonly recognized to have a peculiar public importance. The great German economist, Adolph Wagner, somewhere says concerning transportation: "It has a significance for all human life far beyond material economic considerations, embracing migration and settlement, spiritual and material culture, and so is a condition of universal importance as a real fundamental for the existence and development of civilized society." And again, President Hadley, in his work on Transportation, says: "No one symptom in business or in politics marks the direction of national activity so clearly as does the way in which the transportation system is organized and controlled."

Size of Railway Industry.—Railway transportation is the greatest single industry in the United States, excepting only agriculture. This can be demonstrated on almost any basis of comparison. What other industry has 2,000,000 employees? What other industry has an investment of over $18,000,000,000?

A few facts concerning the magnitude of the railway system of the country will serve to emphasize the importance of the subject. In 1920 there were 252,844 miles of railway line owned in the United States.[1] The net capitalization (stocks and funded debt) of all railway properties was $18,086,000,000.[2] The gross revenue from the operation of the combined railways of the country in 1920 was over $6,300,000,000. For this sum of money the railways transported 1,363,000,000 tons of freight an average haul of 303 miles, and 1,269,000,-

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[1] 250,156 mi. in 1924.

[2] $18,639,664,000 in 1924.

000 passengers, an average of 38 miles. In addition, mail and express services were rendered. The total receipts for this Herculean performance represented an average per capita payment for the country of approximately $59. Of this payment $41 went for freight service and $12 for passenger fares. On account of the higher rates which existed in 1920 these figures are greater than now obtain. But they illustrate fairly the stake that each individual has in the transportation system of the country.

Viewing Railways from Different Standpoints—Instrument of Production.—If the foregoing pages have served to give a fair idea of the general nature of transportation, it is now time to examine more carefully that particular kind of transportation with which this book is concerned.

A railway is an instrument for handling and transporting freight and passengers by land, the primary feature of which is the operation of vehicles which run upon heavy steel bars, called rails. This instrument of transportation is a very large and complicated mechanism, which has so many aspects that no two people are apt to consider it from exactly the same point of view.

The railway may be considered as an economic instrument of production, just as a factory plant or a farm and its equipment. From this point of view the railway would be analyzed into such component parts as land, labor, capital, and business enterprise. The most obvious part of the land factor is the "right-of-way" on which the tracks extend, but there is also the very valuable and important land occupied by stations and office buildings, and some roads also own large tracts of mineral and forest lands. The great army of laborers employed by the railways, such as train men, maintenance of way and shop men, clerks and telegraphers, constitute a large part of the railway problem, and the compensation of the employees makes up approximately 60% of the total operating expenses. The capital factor is found in the shape of track, rolling stock, buildings, and other items of plant and equipment. The board of directors, representing the stockholders, supply the business enterprise. So regarded, the railway is merely a type of productive mechanism, similar to any large manufacturing establishment.

Railways as a Source of Private Gain.—In the second place, we may look upon the railway as a means of private gain by which business men are enabled to make profit by selling transportation service at a higher price than they pay for labor, materials, and supplies required for the production of that service. Problems of business technique would be considered from this point of view in which the traffic or sales department of the railway would play a large part.

Form of Business Organization.—From a third point of view, the railway may be regarded as a form of business organization. So regarded, the corporate form is emphasized, and back of that form we see the body of investors who are interested in the earning capacity and the dividends and bond interest of the railway company. Or from the same point of view, we may consider the business organization as a matter of management, in which case we shall see the operating problem of moving trains, and the traffic problem of the freight and passenger service. As a form of business organization, also, a railway has its problems of departmentalization and the coordination of its various operations. Some roads give their division superintendents complete control, while others place parts of the operations of a division under the supervision of more highly specialized superintendents. In any case, from president, through general manager, to conductors and section bosses, the lines of authority and communication must be kept open and effective.

An engineer would regard a railway as a technical mechanism and would be concerned with its physical properties and operations.

Railways as Citizens.—Finally, a railway may be regarded as a citizen. Each railway has its problem of maintaining right relations with the public and with the government which represents the public. It must conform to the regulations imposed by the government, and it must pay taxes.

Description of a Railway from Technical Standpoint.—For the purposes of this introductory chapter, the technical point of view may best be chosen for the basis of a brief description of a railway. Indeed, the kind and amount of capital are closely connected with the form of plant and equipment, and even the departments of the business organization must conform to the technical structure.

A railway is not a train nor a track nor a freight-house; it is all these things and much more. A glance at the items of railway expenses as set forth in one of the reports of the Interstate Commerce Commission is most illuminating. Following is a partial list of these expenses:

Partial List of Railway Operating Expenses

I. Maintenance of Way and Structures:
- Roadway maintenance
- Tunnels and subways
- Bridges, trestles, and culverts
- Elevated structures
- Ties
- Rails
- Other track material
- Ballast
- Track laying and surfacing
- Right-of-way fences
- Snow and sand fences and snow sheds
- Crossings and signs
- Station and office buildings
- Roadway buildings
- Water stations
- Fuel stations
- Shops and engine-houses
- Grain elevators
- Storage warehouses
- Wharves and docks
- Coal and ore wharves
- Gas-producing plants
- Telegraph and telephone lines
- Signals and interlockers
- Power plant dams, canals, and pipe lines
- Power plant buildings
- Power substation buildings—depreciation

- Power line poles and fixtures
- Underground conduits
- Paving
- Roadway machines
- Small tools and supplies
- Removing snow, ice, and sand
- Injuries to persons
- Insurance

II. Maintenance of Equipment:
- Shop machinery
- Steam locomotives — repairs
- Other locomotives—repairs
- Freight-train cars—repairs
- Passenger-train cars—repairs
- Motor equipment of cars—repairs
- Floating equipment—repairs
- Work equipment—repairs

III. Traffic:
- Advertising
- Traffic associations
- Fast freight lines
- Industrial and immigration bureaus

IV. Transportation—Rail Line:
- Dispatching trains
- Station employees
- Weighing, inspection, and demurrage bureaus
- Coal and ore wharves
- Yardmasters and yard clerks
- Engine-house expenses—yard
- Train enginemen
- Train power produced
- Operating sleeping-cars
- Crossing protection
- Drawbridge operation
- Telegraph and telephone operation
- Express service

V. Transportation — Water Line:
- Operation of vessels
- Operation of terminals

VI. Miscellaneous Operations:
- Dining and buffet service
- Hotels and restaurants
- Stockyards

VII. General:
- Law expenses
- Relief department expenses
- Pensions

Three Factors in the Route—Grade.—First and foremost, the transportation agency which concerns us is a rail-road. This word really consists of two parts, standing for distinct ideas, and from the most general point of view, the railway is above all a road. But roads differ widely from one another, their value depending upon the route taken by them and the character of their roadbeds. The *route* of a railway is of fundamental importance as it affects both operating expenses and earnings. The three chief factors in the route are: (1) profile, or grades; (2) curves; (3) distance.

The most important of these factors are the grades. The existence of steep grades may require the operation of an expensive "pusher" service. It is well known that the great advantage held by the New York Central railway company in its competition with other trunk lines (running from North Atlantic Seaboard to the Middle West) is the virtual absence of grades, due to the fact that it follows the valleys of the Hudson and Mohawk rivers from New York City to Buffalo. The steepest grade on a railway is called its "ruling" grade, while the various ups and downs are spoken of as "rise and fall." The ruling grade generally determines the size of the maximum trainload that can be hauled over the division on which it occurs, and often acts as a sort of bottle neck limiting the capacity of the whole system. The amount of rise and fall, on the other hand, exercises a more general effect on operating expenses and limits train speed. The importance of grades often varies with the direction of the heavy traffic, and when the down-grade lies in the same direction as the predominant traffic, as is the case with certain bituminous coal roads, gravity helps pull the load and efficient results are secured.

Curvature of Route.—The next most important factor in the route is its curvature. Curves in a railway line limit speed and trainload, increase wear and tear, and tend to increase accidents. These effects are especially in evidence if the curves occur on grades, as then the friction of the curve combines with the pull of gravity to resist the progress of the train. Curves restrict trainload and speed chiefly because in rounding them the wheels of the cars are forced and held in sharp contact with the rails, the great friction being evidenced by the shrill singing of the steel—a sound with which all are familiar. By the same token, derailments are especially apt to occur on curves.

Distance of Route.—Distance is not ordinarily so important as either grades or curves, for once on wheels, a few miles more or less have but little effect on transportation expenses. Of course, this idea may be overworked, and it must not be taken to justify freight rates made without regard to distance. But within limits it is true. A good illustration of what is meant is furnished by a comparison of the Baltimore and Ohio Railroad Company with the New York Central. The former has the shortest route from Chicago to the Atlantic Seaboard and is many miles shorter than its competitor, but the New York Central is so much more favored as to grades and curves that it is usually considered to have the more advantageous route.

Other Factors in a Railway's Route.—Other elements connected with the route of a railway are "cuts," "fills," tunnels, and bridges. The necessity for these works obviously depends upon the route taken or upon the policy of the company in meeting the problems presented by the chosen route. Sometimes the only possible course in the beginning is to build cheaply; that means foregoing the cuts, fills, and tunnels which, if constructed, would reduce grades and operating expenses. Tunnels are costly at best, and in the past have often been outgrown, with the result that they have not sufficient width or overhead clearance to allow an economical development of traffic. The Erie Railroad, for example, long depended upon a tunnel at Bergen, New Jersey, which was a veritable bottle neck, restricting all its traffic in and out of New York City. In an analogous way the strength of bridges and trestles, or the number of tracks provided by them, limit the load and volume of traffic. Bridges over such rivers as the Mississippi and the Hudson are important in railway strategy.

The Roadbed.—So much for the route aspect of the "road." The "roadbed" proper is largely a matter of width and ballast. The width of the bed prepared for the tracks varies considerably, and with this factor varies the preparedness of a railway to multiply its tracks to accommodate growing traffic.

It is to be noted that as regards cuts, fills, tunnels, and bridges, the questions of route and roadbed overlap, and not infrequently the lack of width in the roadbed is due to the narrowness of cuts and tunnels.

The upper part of the roadbed is ordinarily covered with a layer of some material which packs tightly but remains porous, such as crushed stone or gravel. Such a layer is called "ballast" and serves several purposes, among which are the distribution of weight of trains over a wider bearing surface and the facilitation of maintenance and track leveling.

The Railway Track.—On top of the roadbed, which is prepared over the length of the railway's route, is placed the "track," or tracks, which consist chiefly of ties and rails. The latter, the use of which gives the railway its name, are now pretty well standardized in this country as to cross-section and composition, although they vary considerably in weight. Practically all rails now are of steel, some roads using the Bessemer and others the open-hearth product. The ordinary range of weight is between 50 and 110 pounds per yard. But considerably heavier rails than this are used, and relatively little of the lighter weight is now laid down.

The rails are fastened to wooden "ties" which serve to keep them in alignment as well as to anchor them to the ballast of the roadbed. It is now good practice to place plates of iron or steel called "tie plates" between the rail and the tie, which lengthens the life of the tie and tends to prevent shearing of the spikes which fasten the rails to the ties. The tie problem is a very serious one for the railways, as the supply of timber suitable for ties has become scarcer. As a result, the railways have gone to great expense in providing for the "treating" of ties with preservatives for the purpose of lengthening their life.

The number of tracks, which is partly dependent upon the width of the roadbed, varies greatly among the different railways but it may be said that as the density of traffic grows the tendency is towards double-tracking, while trunk lines have as high as six tracks over considerable distances. The mileage of single track, or "miles of line," was approximately 250,000 in 1920; the mileage of the second track—and accordingly of double-tracked line—was approximately 30,000. In addition, there were approximately 2,800 miles of third track and over 2,000 miles of fourth and other main tracks.

Next to the mileage of single main track, the most important trackage is that found in yards and sidings, which amounts to over 106,000 miles. It is to be borne in mind that the passing tracks, or "sidings," are of the utmost importance in operating a railway, and upon their frequency and length depends to a large extent the volume of traffic that can be handled. Their number limits the number of trains that can be operated at a given time, and their length limits the number of cars per train. Much the same can be said of the "yards" at terminals.

Rolling Stock—Locomotives.—After the rail-road proper, with its route, roadbed, and track, the second great division of the railway plant and equipment consists of the "rolling stock," embracing various types of locomotives and cars.

Locomotives may operate by steam or electricity, and electric locomotives are now frequently found in use at congested terminals, in tunnels, or over mountains where power is cheap. Freight locomotives differ widely from the passenger type, being constructed to give greater tractive or pulling power by putting more weight on the drive wheels and to develop a maximum power at lower speed. A special type of locomotive is also required for switching and yard service.

The locomotive is the motive power of the railway mechanism, and over one-third of the total operating expenses of a railway go to maintain this power. In 1917, which may be taken as a fairly typical year, the items covering repairs, fuel, engine-house service, and wages of engine men for steam-train locomotives were 29% of total operating expenses, and yard locomotives required 4% additional.

Elsewhere there will be occasion to observe that one of the vitally important operating conditions is the speed with which trains are moved over the line. Already it has been pointed out that grades and curves are important as limiting the speed of trains, and here it should be noted that the average speed or miles per day made by the cars of a railway are naturally dependent in part upon the quantity of locomotive tractive power available. This, in turn, depends upon the number, size, type, and condition of locomotives possessed. Naturally, individual railways differ widely in the adequacy of their tractive power; but there has been a great increase in the country as a whole as is shown by the following statement:

Year	Number of Locomotives	Tractive Power Pounds	Tons Carried One Mile (000 omitted
1902	41,225	839,073,000	157,289,370
1910	58,240	1,588,894,000	255,016,910
1920	*66,511	*2,399,157,000	*411,151,191
Increase, 18 years	61%	186%	162%

* Estimated.

The figures show, first, that the tractive power has increased more rapidly than the number of locomotives, which means that the average weight and efficiency per locomotive have increased; and second, that tractive power has increased more rapidly than traffic. The number of tons-carried-one-mile per unit of tractive power was less in 1920 than it was in the earlier years.

Freight- and Passenger-Cars.—Coupled with the power furnished by locomotives there must be the carrying capacity of cars. Naturally, railway cars fall into two great groups: freight-cars and passenger-cars. The diversity of the service performed by the railways and their obligations as carriers are indicated by the variety of their equipment. Under the head of freight-cars we find listed box cars, flat cars, coal-cars, stock-cars, tank-cars, and refrigerator-cars. The two largest classes are the box cars, of which there are over 1,000,000, and the coal-cars, numbering over 950,000. Did space permit, it would furnish an interesting sidelight on the railway service to mention the numerous types of special-service freight equipment provided by the carriers, including milk-cars, poultry-cars, automobile-cars, etc.

Under the head of passenger-cars, or better, passenger-service cars, come chiefly the regular passenger coaches and various combination passenger-cars, numbering well over 36,000; but in addition there are baggage-cars, dining-cars, postal-cars, parlor-cars, sleeping-cars, emigrant-cars, and other types, which bring the total number up to approximately 55,000. Of these about 27% are of steel construction. The seating capacity of all passenger-cars combined is estimated at nearly 2,300,000.

The tendency has been toward a steady increase in the capacity of freight-cars, and while the average capacity in 1902 was 28 tons, it had increased to over 41 tons in 1920. The freight-cars now being put into service average well up to 50 tons capacity. The increase in number of freight-cars during the last decade has been much less than in proportion to the increase in freight tonnage, but the increase in the capacity of the cars has, in large part, made up for this apparent failure. Undoubtedly, this condition tends towards economy in operation, for, as a rule, the proportion of "dead-weight" is lower when the cars are larger.

One of the great problems of American railways lies in the recurrent periods of car shortage and surplus. Railway traffic is highly seasonal, and in order to handle the peak of the load, which comes in the fall, it is necessary to provide a much greater car capacity than is required at other times. In any case, the volume of traffic varies from year to year on account of changing industrial conditions. Frequently, there is a car shortage in the month of September or October of over 50,000, while there is a surplus in May of over 100,000; but in some years the shortage may be in the neighborhood of 150,000 and the surplus may amount to over 400,000.

As giving some idea of the importance of locomotives and cars as a part of the railway investment, the following figures, showing some prices paid for railway equipment, will be of interest. Of course, prices vary widely with changes in the general price level, but so few persons have any idea as to what a freight-car costs that the figures given will promote accuracy of thought.

PRICES PAID FOR EQUIPMENT

	1917	1923
Heavy freight locomotive	$47,081	$53,550
Passenger locomotive	33,142	66,200
Passenger coach	9,506	28,900
Freight-car	2,100	2,301

In addition to the various kinds of cars mentioned, the railway requires numerous kinds of mobile equipment for constructing and maintaining its plant, such as equipment for removing wrecks, snow-plows, weed-burners, cranes, track-layers, etc.

Other Equipment.—In order to house and repair its rolling stock and to handle freight and passengers, a large investment in buildings and fixed equipment is necessary, including shops, terminals, line stations, telephone and telegraph systems, signal systems, water-tanks and wells, fences, snowsheds, etc.

Particularly important are the numerous items of investment that are included under the head of "terminals." Here come the various kinds of freight-yards and engine roundhouses. To receive, store, and ship, for example, the 2,305,000,000 tons of freight carried in 1920, vast depots and warehouses had to be constructed and maintained, with their attendant elevators, piers, and equipment for loading and unloading heavy articles. The billion passengers carried each year must be provided for through adequate passenger stations; and the great mass of clerical, accounting, statistical, and administrative work involved in supplying transportation to a nation of over 105,000,000 people must be carried on in suitable office buildings.

All this is to say nothing of the variety of floating equipment in the terminals of those railways which enter ports, where tugs, car-floats, lighters, and floating elevators play an important part.

Summary.—In the foregoing, we have defined transportation and the railway, and we have pointed out the nature and importance of the transportation service with especial regard to the railway. Incidentally, some data have been presented to bring out the magnitude of the railway system of the United States. This material has been supplemented by a sort of outline picture of the railway system of the country, regarded as an operating mechanism, a picture which has been sketched under the following heads:

- I. THE RAILWAY LINE:
  - 1. Road:
    - (a) Route:
      - (1) Grades
      - (2) Curves
      - (3) Distance
      - (4) Bridges and tunnels
    - (b) Roadbed:
      - (1) Ballast
  - 2. Track:
    - (a) Rails
    - (b) Ties

II. Rolling Stock:
  1. Locomotives (Steam and electric)
    (a) Road locomotives:
      (1) Freight
      (2) Passenger
    (b) Switching locomotives
  2. Cars:
    (a) Freight service
    (b) Passenger service
  3. Other mobile equipment

III. Terminals, Buildings, and Fixed Equipment:
  1. Yards, roundhouses
  2. Freight depots, warehouses, and elevators
  3. Passenger stations
  4. Offices
  5. Floating equipment
  6. Line stations
  7. Telephone, telegraph, and signals
  8. Shops
  9. Miscellaneous

CHAPTER II

THE INTERNAL ORGANIZATION OF A RAILWAY

Importance of Understanding Railway Organization.—A railway company is a form of business organization, and, as such, has various relations with the public and with other railways, which are important. On the other hand, there are equally important practical matters of internal organization which affect the success of railway operation and the efficiency of railway service. It is worth while to know something of the internal organization of a railway. It gives to the general student and the citizen a better knowledge of railway functions, to the business man a better understanding of the problems of business organization in general, and to the shipper a better basis for dealing with the carriers, as he will more clearly comprehend the functions of the different officers with whom he must deal.

General Principle of Organization.—Organization is a condition of balance within a more or less complex body in which the parts are coordinated with reference to the purpose of the whole. There are four basic factors in any organization which have their especial importance in business. These are: (1) specialization, (2) harmony, (3) responsibility, (4) flexibility.

Specialization becomes necessary with size or variety of function. When a railway covers a wide territory, has a dense traffic, or develops a variety of services, it becomes necessary to specialize by departments. For instance, one official was formerly generally known as "secretary and treasurer" and there was no separate "purchasing agent." Now all the great systems have separate secretaries and treasurers, and the "purchasing agent" has a distinct and important position.

Harmony, or cooperation, becomes important in proportion to specialization; for, just in proportion as special departments are established, it is essential that these departments should function in harmony with one another. An illustration of how this works out in the railway business is found in the establishment of the position of director of traffic, for the purpose of coordinating the work of the several general freight agents.

Initiative is required on the part of each branch of the service in order that local problems may be met promptly and that subordinate officers may have a chance to develop the quality of leadership to a reasonable extent.

Responsibility is the quality required to control initiative and it should exist in proportion to power. Unlimited initiative is impossible.

Specialization and harmony are the static factors in organization and mean smoothness in functioning. On the other hand, initiative and responsibility are dynamic factors, which, if but combined in proper proportion, may lead to a desirable flexibility of organization. Thus, if the division superintendents of a railway are given sufficient power, subject to control, the system has the capacity for meeting local emergencies and making adjustments to the local environment.

Division of Railway Systems into Great Parts and "Divisions."—When a railway "system" is very long, say in the neighborhood of 10,000 miles of line, and at the same time has a dense traffic, it is generally expedient to divide it into great parts, regions, or districts—sometimes called "grand divisions"—in order to allow closer and more specialized supervision. The New York Central Lines, for example, embrace over 12,000 miles and are divided into two great parts, "Buffalo and East," and "West of Buffalo." Each has a complete set of operating officials headed by a vice-president. The Pennsylvania System, with 10,531 miles, is divided into an "Eastern Region" with 4,006 miles, extending west to Altoona, Pa.; a "Central Region" with 3,261 miles, extending from Altoona to Columbus, Ohio; a "Northwestern Region" with 1,500 miles, extending from Columbus to Chicago; and a "Southwestern Region" with 1,764 miles, extending from Columbus to St. Louis and Louisville. Such organization means that a set of general managers or vice-presidents and other semi-general officers is interposed between the "system officers" who manage the whole organization and the division superintendents who manage the local operations on short stretches of line.

All degrees of organization like that found in the Pennsylvania System exist. The Southern Railway System is divided into "Lines East" and "Lines West." A single vice-president in charge of operation supervises both of these great parts of the system from the Washington office, but there are separate general managers in immediate charge, one located at Charlotte, North Carolina, and the other in Cincinnati, Ohio. The Union Pacific System, with 9,368 miles, contains a suggestion of the same organization, but in a more rudimentary state of development. The system consists of the Union Pacific Railroad Company, the Oregon Short Line, the Oregon-Washington Railroad and Navigation Company, and the Los Angeles and Salt Lake Railroad Company, each of which has a more or less distinct working organization but all of which have the same president and the same vice-president in charge of operation.

Whether or not a railway is divided into "grand divisions" or subsidiary companies as in the foregoing cases, if it has any considerable density of traffic and is over 300 miles in length, it is organized into territorial parts which are always called "divisions," and each division has a separate set of division officers. On a railway of less than 300 miles the various heads of departments—operating, traffic, law, treasury, etc.,—could directly manage all details. The traffic manager, for example, could be vice-president in charge of traffic, general freight agent, and general claim agent, all in one. But for a larger system the administration becomes more complicated and a divisional organization is required.

General Corporate Organization.—In common with all business organizations, a railway must have an organization of ownership and direction. Bondholders and stockholders, as owners, must be able to secure information and exercise such control as is provided for in the certificate of incorporation and by-laws; while the directors and executives must exercise the administrative functions in an organized way.

All railways are corporations. This is significant as to their relationship with the public, as to finance, and as to exercise of control by owners and investors. It means that the railway has certain rights and obligations characteristic of the corporate form and that it may be compelled by the state to maintain its existence and perform its functions continuously.

The railway corporation has the usual officers, such as president, secretary, treasurer, chief counsel, and controller, that are found in all large corporations and these officers exercise the usual functions. We shall merely note in passing that in the law department of the railway many controversies arising from claims have to be handled and consequently special claims attorneys are provided for. An interstate road may have state attorneys on the one hand, and on the other a commerce counsel to deal with the Interstate Commerce Commission.

On account of the different branches of the service, we find under the controller, or general auditor, auditors of freight traffic, passenger traffic, dining-cars and hotel accounts, and traveling auditors.

Organization for Operation—General Officers.—In the organization for operation, a railway has two departments concerned with transportation, which are characteristic. These are the operating and the traffic departments.

At the head of the *operating department,* there is a general officer who is generally known either as "vice-president in charge of operation," or as "director of maintenance and operation." He is one of a group of high executive officers, having the status of a vice-president and subject to the general policies of the board of directors as carried out by the president's office. In operating matters he is generally the court of last resort.

Under this vice-president, is the general manager who is in immediate control of operations involving maintenance of way, equipment, and train movement. To him report the heads of the various operating departments, which are: (1) the road department, usually in charge of a "chief engineer"; (2) the machinery department, usually in charge of a "superintendent of motive power"; and (3) the transportation department, in charge of the "general superintendent." As the names indicate, the functions of these departments are, briefly, as follows:

1. The *chief engineer*, in his department, has the construction and maintenance of way and structures in charge, including roadbed, track, bridges, water supply, and all buildings. The work involves the determination of standards, plans, and specifications.

2. The *superintendent of motive power* supervises, under general instructions from the general manager, the maintenance of all rolling stock, including locomotives and cars. It is

his function to prepare specifications for equipment and to operate repair shops for keeping locomotives and cars in working condition. On some roads the employment of enginemen and firemen comes under the duties of the machinery department.

3. The *general superintendent of transportation* is responsible for the movement of passengers and freight. He takes the locomotives from the machinery department and the roadway from the road department, and utilizes them for the final act of transportation. This department has to do with the distribution of cars and the organization of the station service. Needless to say, it is responsible for the organization of the train service and for the protection of the property of shippers. It is natural, therefore, that the adjustment of loss and damage claims sometimes falls to this department. Under the general superintendent there is sometimes a "superintendent of telegraphs," who supervises the operation of telegraphs and telephones.

Division Officers in Operating Departments.—The foregoing officers may all be classed as "general," inasmuch as their duties cover the railway as a whole. But as already stated, a railway of any great length must fall into divisions in order to provide the means of meeting effectively the different local problems. Accordingly, we find "division superintendents." These men are the wheel horses of the railway organization, and under the most common form of organization each division superintendent is in entire charge of all operations on his division, which may be from 100 to 500 miles in length. The division superintendent in all cases reports to the general superintendent of transportation from whom he receives his orders. He is a sort of local general manager—the general manager of a division—and like the real general manager, he has under him officers representing each one of the three main branches of railway operation. Reporting to the division superintendent, ordinarily we find the "roadmaster" or "division engineer," who has charge of maintenance of way and structures on the division; the "master mechanic," who is responsible locally for the condition of the rolling stock; and the "train master," who supervises the movement of passenger and freight traffic over the division.

This brings the general operating organization down to the points of contact with which the public is most familiar; for under the train master come the station agents, the train dispatchers, and the yard masters on each division. The road master, or division engineer, has under him a track foreman, the master carpenter, and the signal supervisor; while the master mechanic oversees the engine-house and the car inspectors.

Line of Authority.—The general scheme of organization described above is somewhat idealized and subject to minor variations, but represents fairly closely the prevailing practice. In outline it is as shown in Fig. 1.

Perhaps the two most notable points about the outline are, first, that the threefold division of operation into road maintenance, equipment maintenance, and train movement shows itself near the top and is clearly maintained throughout. In the second place, it is noticeable that the line of authority passes from the general manager to the superintendent of transportation and from him to the division superintendent, the tendency being to emphasize train movement. This is natural, as the other departments, after all, exist for the purpose of providing means by which traffic can be carried over the line.

The Traffic Department—Origin and Growth.—The primary object of the traffic department is to sell railway transportation. The traffic department is the sales department of the railway. Its function is to secure orders for the service which the railway holds itself out to perform—for a railway, being a producer of services rather than of commodities, can work on orders only—and to that end the well-organized traffic department will look far into the future in seeking to develop the population and industries served by its road.

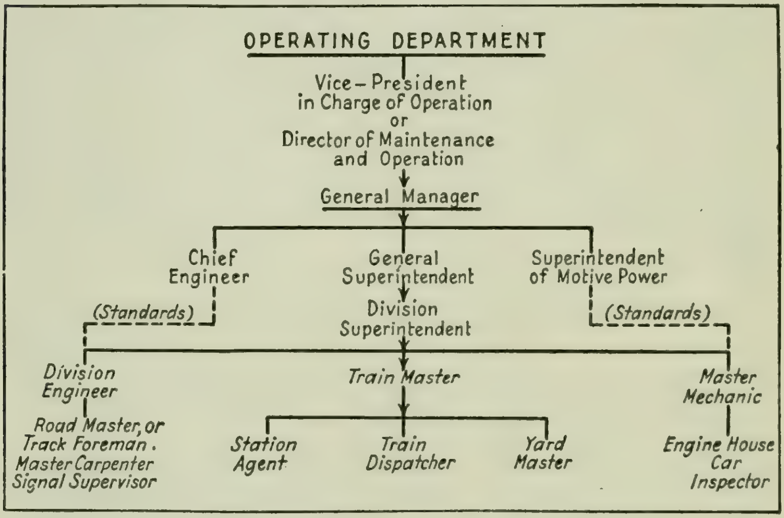

Fig. 1.—Typical Organization of an Operating Department

The traffic department is relatively new as a distinct branch of the railway business, and its relative importance is even yet not realized to the full. It is especially important to glance for a moment at its origin and growth.

In the early days of the railway it was the general superintendent of transportation who issued tariffs and gave directions concerning freight to the agents. The extension of the roads, however, and especially the resulting competition, required a more complex organization—one more specialized to meet the competition for traffic. Accordingly, the office of general freight agent was established, and from this office directions to station agents concerning their traffic duties were issued. That this development was made fairly early is evident from the fact that as early as 1866 there was a temporary "Association of General Freight Agents."

As competition in rates became keener in the 70's and 80's, the "freight solicitor" began to exist as a subordinate of the general freight agent, his business being to solicit business from prospective shippers. As is so often the case with salesmen, he was inclined to cut rates in order to get business. When pools and rate agreements became more effective—say in the early 90's—the freedom of action of the freight solicitor was limited, and the function of the general freight agent himself became more largely one of representing his road at conferences in which traffic and rate policies were settled.

With the more recent consolidations there has come the "freight traffic manager," or "director of traffic," who serves as the general policy man for the great railway system. He centralizes the work of the general freight agents, and studies freight traffic problems in their broader aspects, perhaps even taking up the possibility of developing traffic-yielding industries along the line of his road.

In the most recent years, the increasing effectiveness of government regulation, largely by preventing rate-cutting and rebates, has reduced the pressure that shippers can bring to bear upon the carrier and has thus considerably modified the function of the traffic department. Instead of dealing with rate wars or discriminatory advantages to industrial shippers, a meeting of traffic officers nowadays deals chiefly with such questions as the exchange of traffic among roads, the division of rates, and the establishment of joint rates to permit the movement of some commodities in greater volume or to a new market.

Traffic departments may have a dynamic and highly constructive effect, as is evidenced by the fact that the southern fruit and vegetable business has been largely developed by the railways, and the connection of the New York market with the Long Island potato fields has been attributed to the enterprise of a railway traffic department.

Organization of Traffic Department—Freight.—The organization of a typical traffic department at the present time is somewhat as follows. Generally, there is a vice-president in charge of the department, although the one occupying this position is sometimes called "director." He is responsible to the president of the railway company, and thus ultimately to the directors and stockholders, for maintaining the business of the road, and in this connection he naturally has general supervision over rates. He also sometimes passes on loss and damage claims in so far as general policies are concerned.

Under the vice-president, or director in charge of traffic, in the case of the larger railway systems, comes the "freight traffic manager," who reports to the vice-president and supervises the freight traffic over the entire road. He keeps in touch with commercial interests along his line, maintaining friendly relations with large shippers and attending to interchange relations with other roads. Naturally, interline rate questions come to his attention. He may rule on the larger and more difficult claims, if claims are handled in the traffic department.

The "general freight agent" has been called the pivotal official in the traffic department and this he truly is. Indeed, he corresponds rather closely to the general superintendent in the operating department. The smaller and medium-sized roads may have no freight traffic manager and only one general freight agent, but the larger systems may have several general freight agents, each covering only a part of the road. The general freight agent is directly responsible for the execution of orders emanating from the head of the traffic department. It is his duty to solicit and maintain the freight traffic, to make and cancel rates, to publish tariffs, to handle tracers, and, on many roads, to pass on overcharge claims and most loss and damage claims.

Tariff Bureau.—Reporting directly or indirectly to the general freight agent, there may be a "chief of the tariff bureau," though on smaller roads there may be no separate tariff bureau. A tariff bureau compiles and distributes tariffs and handles all percentage arrangements for dividing joint rates with connecting lines. Often, too, it prepares statistical data for rate cases.

Division and Special Freight Agents.—Under the general freight agent, come division freight agents and district freight solicitors. The division freight agent is in charge of all freight matters on his division and deals directly with shippers and local freight agents. The solicitor, or commercial agent, represents the last trace of competition in rates. He is the railway's "outside" man. He is supposed to be familiar with rates everywhere and endeavors to smooth the way for shippers by facilitating service, assisting in tracing and expediting shipments, and serving as an intermediary between the shipper and the operating department.

When a railway has developed a large volume of business in some particular commodity, it may have a special official to look after that branch of traffic. Thus, a number of roads with large coal traffic have a special coal freight agent. Also roads with seaboard terminals generally have a foreign freight agent under the general freight agent, who keeps in touch with ocean rates and the foreign trade situation, and facilitates the transfer of freight at the seaboard.

The "freight claim agent" is generally in the traffic department under the traffic manager, though he may be either coordinate with or subordinate to the general freight agent. There is sometimes a "chief claim agent" or "claims attorney" in the legal department. The freight claim agent has immediate charge of handling claims arising on account of loss, damage, or overcharge, making the necessary investigations and adjustments.

Development of New Business.—One of the most interesting parts of the traffic organization is that for the development of new business. Many railways leave the problem of developing old industries or establishing new ones, to the regular organization of the freight agents, but some have set up special agencies for this purpose, either within or outside of the traffic department. The Rock Island railroad had in the traffic department a special "industrial commissioner," a "general dairy agent," and an "agricultural and horticultural commissioner." The Baltimore and Ohio has an "industrial agent" in the traffic department; and the Chicago, Burlington and Quincy Railway, an industrial commissioner. The Erie and the Missouri Pacific are two roads which appear to have separate industrial commissioners outside the organization of the regular traffic department. The chief business of these officers is to create new traffic, this work being assigned to separate departments in recognition of the need of specialists for that purpose.

Outline of Typical Organization.—In Fig. 2 is shown a condensed outline of the organization of the traffic department of a fairly large railway. In case of a very large system there would be separate regional traffic managers and assistant traffic managers, and assistant general freight agents.

Passenger Traffic Organization.—Thus far, all that has been said concerns freight traffic, and in view of the fact that

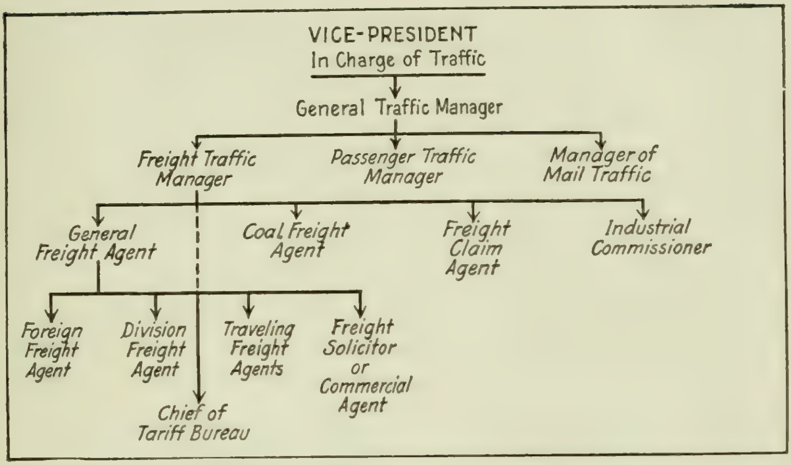

Fig. 2.—Typical Organization of a Traffic Department

much the largest part of the average railway's net earnings comes from the freight service, this priority of attention is fair enough. In the traffic department, however, coordinate with the freight traffic manager, there is a "passenger traffic manager," under whom are the "general passenger agent" and his assistant, under whom in turn are the district passenger agents, division ticket agents, and the general baggage agents. The functions of these officers may be readily inferred from their titles and from what has been said about the freight traffic organization.

Other Departments.—In addition to the departments which are distinctively "operating" or "traffic" in their function, there are several important branches of railway organization which have a more general function. These departments are subordinate to general officers and are intimately connected with operating and traffic. But they serve to combine these two departments and to bring them into cooperation for more effective transportation service. Chief among these departments are: (1) purchasing department, (2) telegraph and telephone, (3) car service.

In a well-organized railway the purchasing agent has complete charge of buying and selling every kind of material used by the road from steel to stationery, and consequently his department serves both operation and traffic. As is true in other businesses, the purchasing department is handled variously in the scheme of railway organization, but it is becoming more general to place it under the operating department, while keeping it distinct and coordinate with the major operating divisions. Thus, in the organization of the New York Central the purchasing agent is directly under the general manager, coordinate with the various superintendents of motive power, etc., and the chief engineer. One large railway company, however, gives its "director of purchases" a distinct department, making him coordinate with its director of transportation and its director of maintenance and operation; but this same line has a "purchasing agent" whose main subordination is to the general manager.

The superintendent of telegraph usually reports to the general manager and is coordinate with the general superintendent, but he may come directly under the vice-president in charge of operation. Obviously, the telegraph and telephone systems of a railway serve all parts of the organization, including the traffic department, and consequently the superintendent of telegraph should logically come near the top of the organization and is best not subordinated to the superintendent of transportation, to say nothing of the division superintendent.

The car service agent, when there is one, has as his function the proper distribution and use of cars, and thus he, too, renders a rather general service which brings him towards the top of the operating organization and separates him from those who report to the division superintendents. Usually he reports directly to the general superintendent. The ordinary procedure when a shipper desires a car is to order it through the local station agent, who reports the order to the dispatcher. The dispatcher is under the superintendent of transportation.

The three foregoing branches of the organization represent in varying degrees the importance of maintaining officers whose part it is to correlate different branches of the railway service to the end that they may function harmoniously. They usually work within the operating department—although the purchasing agent is sometimes outside of that department—but they have such a distinctness and such a direct relation to the general manager that they are marked as peculiarly related to other departments and to the railway's contacts with the public.

Departmental Organization.—If the foregoing is sufficient to give a general idea of the prevalent form of internal organization of the railways of the United States, it is time to note that there is one fundamental difference which divides the organizations of some of our main roads into two groups. Whether there is a separate traffic manager over the general freight agent or not makes little difference, but the question of departmental versus divisional organization is vital. The traffic department is ordinarily organized on the divisional or "line" basis, but in the operating department one group of roads follows the departmental or "staff" system, while another group—the larger—adheres to the divisional or line system.

The essence of the question, in so far as operation is directly concerned, is the relation of the division to the central authority. Under the departmental or "staff" system each officer at the head of a local department or exercising a distinct function is directly responsible to a central departmental head. The *department* is subdivided territorially and the "divisional" engineers, mechanics, and superintendents, report to "general" or "chief" engineers and superintendents at the top who serve the whole organization. This form of organization is illustrated in Fig. 3, which follows an outline of one of the great systems which has chosen this form.

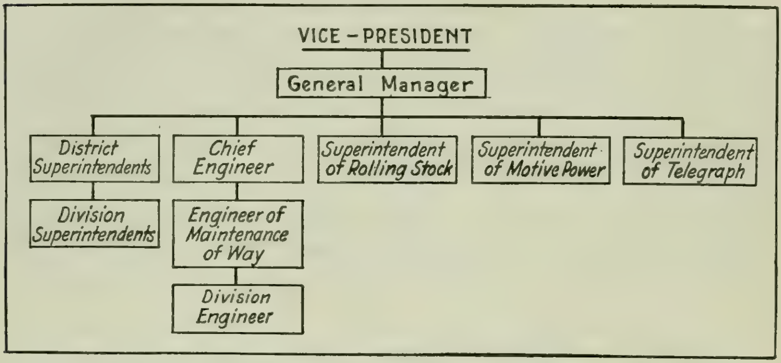
VICE-PRESIDENT
General Manager
District Superintendents
Chief Engineer
Superintendent of Rolling Stock
Superintendent of Motive Power
Superintendent of Telegraph
Division Superintendents
Engineer of Maintenance of Way
Division Engineer

Fig. 3.—Departmental Type of Operating Organization

The foregoing is the main framework of the operating organization for a part of the system. It will be noticed that the district Superintendent (of Transportation) is only in charge of transportation; the division engineer is not under the division superintendent but is in an entirely different stream of authority, reporting as he does indirectly to a "chief engineer." Under this system there is a large number of coordinate officers at the top, including a superintendent of rolling stock, in addition to the superintendent of motive power, and a superintendent of telegraph.

Divisional Organization.—The divisional organization, which is a kind of "line" organization, has been described in discussing the operating department in general. The essential difference is that it concentrates authority over all departments or functions within a geographical division, in the hands of a superintendent, who reports to a general superintendent. Responsibility is concentrated in geographical divisions rather than diffused among functional departments. (See page 24.)

A critical examination of the relative advantages of each form will make its significance clearer. The great disadvantage of the divisional system lies in the difficulty of securing harmony or unity of action throughout the system as a whole. Under this system the chief executive, represented by the general manager, has a group of division executives reporting to him, each one of whom has a different group of local experts. In practice a board of experts is generally added to advise the chief executive, but friction is apt to develop between the two groups. The whole story is told in the word "standards." It is difficult to develop and maintain uniform standards of operation under the divisional system, and for the effective operation of a railway system a large amount of standardization is desirable.

At the same time, the divisional system does not afford so great a chance for specialization as does the departmental system. Instead it develops broadly trained men by breaking down departmental lines which would emphasize the power and opportunity of the heads of special departments. It tends to set up a series of little general executives, each one of whom undertakes to direct all the functions or departments which fall within his territory.

On the other hand, the divisional plan has such advantages that it is the one generally adopted for operating railways in this country. Its great advantage is its elasticity, which enables a great system to meet the varying needs of the territories which it serves. Like the governor of one of our states, the division superintendent deals with all the operations of his division. Furthermore, while it is a problem to maintain unity throughout the system, complete cooperation is assured within each division.

A further important advantage lies in the fact that the divisional plan develops broadly trained men, who by experience may become qualified to fill such positions as that of general manager or even that of president.

Relative Advantages and Disadvantages of Departmental Plan.—The great adverse criticisms of the departmental plan are that it causes difficulty in securing cooperation within the division and lacks elasticity. Each division, it will be remembered, has its transportation, machinery, and roadway departments which must function together in the movement of trains. The smoothness of this functioning may be hindered by friction or delay when each branch of the service is separately subject to rules which are laid down by the remote general staff officers of three separate departments.

The lack of elasticity, which is the disadvantage of departmental organization, is an indication of its great advantage, —an advantage which arises from its combination of (1) uniformity and (2) specialization. Each department is headed by a highly developed specialist and his standards are enforced throughout the entire system in so far as his department is concerned. This plan is best for securing uniformity throughout the system as a whole.

Both Forms of Organization Combined.—In practice, the departmental and divisional forms of organization are combined, to some extent, with the divisional form generally most prominent in the operating department. On very short lines there may be no "divisions" and consequently there is no organization problem of exactly the sort now under discussion. As the length of railway system increases and traffic becomes more dense, divisions become necessary and then the problem arises of securing, (1) a close cooperation among the various branches of service functioning on each division, and (2) a correlation of all the work of each division with the rest of the system. If the former problem is emphasized, the organization becomes divisional; while especial attention to the latter problem brings the departmental form. Departments —such as auditing, finance, and pension—which have no problem of handling great variety of function and different local conditions, are relatively simple and within themselves follow the "line" type of organization. It is the variety of function *within* the operating department that makes the difficulty there.

Looking at the railway as a whole, without regard to the problems within any single department, the problem is to secure harmony and unity of action among all departments. This can be accomplished either by bringing them together at the top through cooperation among a staff of general officers, each one of whom is a specialist, or through combining them locally under the control of a division superintendent and placing the divisional organizations under a single general manager (who, of course, is not a specialist). In practice, the latter course is usually taken in handling the "operating" department. In this process, certain officers or departments help by (1) connecting the service of two or more departments, as does the car service department or car accountant, or (2) by acting for two or more departments as does the purchasing agent. The accounting and statistical departments help to tie the whole organization together.

It seems not improbable that in the future, as railway problems become less dynamic and industrial conditions are more stable, the importance of elasticity in organization which has been so great in American history hitherto, will diminish. At the same time standardization of practice will grow. For these and other reasons, it may be expected that some further development of departmental organization will take place. This, however, will probably not mean anything more than a joint use of the two systems, in which departmental organization will play a somewhat larger part than it now does on most railways.

At present, there is need of further development of "liaison officers" to insure effective cooperation among railway departments. To the end that the shipper may receive better service, the operating and traffic departments need more united direction than can be given by the freight solicitors. Unity has been gained in purchasing and accounting, but in service much remains to be accomplished.

CHAPTER III

RAILWAY OPERATING AND TRAFFIC STATISTICS

Importance of Railway Statistics.—Probably in no other industry do statistics play so large a part as in the case of the railway. This is true partly because of the extensive and complicated nature of a railway business, partly because of the requirements of the many investors upon whom railways depend for capital, and partly because of government regulation.

As has clearly appeared in the chapter on railway organization, the administration of a railway's affairs is a sort of hierarchy in which there are successive strata of officials, each having broader powers and requiring more comprehensive and condensed information. Beginning at the bottom, let us imagine a switch crew at work in a terminal yard. It cuts out certain cars from a freight train and rides them over the "hump," whence by gravity they roll down the proper track to make up a certain train. These men are operating under the supervision of a yard master whose problem is to get the greatest number of cars through his yard and at the least expense. While he is in direct touch with conditions, he must know something about the weather and rail situation, main-line irregularities, etc.

Over the yard master is the train master of the division whose problem is to keep trains running with the fullest utilization of motive power. He must have a comprehensive knowledge of weather and rail conditions, coal, and the firing of the locomotives, condition of air-brakes, and the amount of overtime made by train crews. To have such knowledge he must depend upon reports which are in the nature of statistics.

Over the train master stands the division superintendent, seeking to make the best showing for his division by increasing the tonnage hauled in proportion to the miles made by each locomotive, and by reducing delays, overtime, and fuel consumption. He must have a picture of the whole situation on his division, embracing the need for or availability of the various agents for supplying transportation, including power, passenger and freight-cars, passing tracks, grades and curves, water and coal stations, and signals. He must supervise time-table adjustments and interchange conditions with other roads.

And so it goes on up the line, each higher official requiring a greater mass of information and one which is, therefore, more condensed. The lower officials sum up the information and pass it on, the details being eliminated. It becomes generalized as it goes up, and thus furnishes the basis for general policies decided upon and supervised by general officers. The only way a complicated business organization can be run is through the intelligent collection, presentation, and use of statistical records.

Needless to say, those outside the railway organization, whether government or investors, must depend upon the statistics in their dealings with railway problems.

Five Fundamental Sources of Railway Statistics.—We will deal in this chapter only with the operating and traffic statistics of a railway. Such statistics are all based on reports made by minor railway officers in the course of their regular daily work. There are five fundamental statistical papers which are the sources of practically all available data. First, we may mention the "train dispatcher's sheet," on which he records the movement of trains and from which it is usual to secure all the statistical data on locomotive mileage.

Equally important are the conductor's "wheel reports," which are the source of all information concerning car-miles and train-miles.

Another chief source of statistical information, at least for many railways, is furnished by the station agent's daily reports or abstracts, which are made from waybills. Each agent periodically turns in an abstract covering all his freight business made from the waybills which accompany each shipment, which abstract shows the tonnage involved in that business. These tonnage figures when combined with the mileage figures, which can be inserted by clerks, give us our data concerning "ton-miles."

Two other sources of important data are the "time-books" of the division superintendent which furnish labor records, and the engineer's coal and oil tickets from which the railway sums up its expenditure for those important supplies.

Operating vs. Traffic Statistics.—Before passing to an examination of the chief statistical units for measuring the railway's business, it is desirable to pause for a moment to note certain general classes of railway statistics.

A distinction of considerable importance to a railway man is that between operating statistics and traffic statistics, which, in a general way, corresponds to the difference in the work of the operating and traffic departments. Operating statistics have as their problem the securing of information that will enable the handling of the greatest gross tonnage at the least expense. They deal with the performance and with the expense of performance, and set forth quantities of gross tons hauled, miles per day, fuel consumption, and similar data. From this point of view the railway is a matter of mechanics and organization for operation.

Traffic statistics seek to show the way to get the largest *net* tonnage and earnings, to which end they present data concerning net tons hauled, revenue received—especially the net revenue—volume of particular commodities, loss and damage claims, and the like. Traffic statistics have grown in importance as more attention has been given to analyzing net earnings and as more intensive study has been made of particular classes of traffic, shippers, and localities.

The first few paragraphs of this chapter well illustrate the nature of operating statistics. The practical use of traffic statistics becomes apparent when a jobber at a competitive point seeks a lower rate to enable him to break into a new market. Only traffic statistics covering the movement of various commodities into and out of certain localities can answer the question, "Will it pay to make the reduction?" Or a shipper may demand a reduced rate in return for furnishing a large volume of traffic. Plausible as the demand may seem, it is certain that to reduce the rate in question will lead to lower rates in other commodities and on shipments to intermediate points. Only traffic statistics can answer the question, "Will it pay?" Commodity statistics, too, showing the quantity and the average revenue per ton-mile are valuable as a basis for laying plans to increase traffic.

Passenger Statistics Not So Important.—We shall have little to say concerning passenger statistics, and consequently it may be noted at once that such statistics have relatively little importance in railway operation, for the simple reason that there is relatively small opportunity to economize in the passenger service. The tractive power of passenger locomotives is rarely fully utilized, and consequently there is little chance to improve conditions in that respect. A very large proportion of passenger expenses is fixed. There is little chance to add or take off trains under normal conditions. Consequently, from the railway man's point of view, statistics of the passenger service do not begin to compare in importance with those concerning the freight service. This situation may not be true of a few roads which have as their chief business the handling of dense local passenger traffic, but it holds in general.

Classification of Operating and Traffic Statistics.—All operating and traffic statistics may be classified under the heads shown in Fig. 4.

- I. SERVICE STATISTICS
  - 1. Quantity
    - Weight—ton-mile
    - Capacity—car-mile
  - 2. Quality (Utility)
    - Speed—miles per day
    - Punctuality
    - Frequency
    - Direction
    - Convenience
    - Safety—accidents, loss, and damage
    - Commodity
  - 3. Economy (Cost)
  - UNIT OF TRANSPORTATION PRODUCT
- II. COST STATISTICS
  - 1. Operation
    - Performance (effort)—Gross ton-miles
      - Train-miles
      - Locomotive miles
    - Expense
  - 2. Traffic
    - Revenue operations—net ton-miles
    - Net income
  - UNIT OF EXPENSE AND INCOME

Fig. 4.—Classification of Railway Statistical Bases

As to the first or *service* viewpoint, it is obvious that the quantity of transportation product may be measured in either units of space or of weight. The car-mile unit (a car hauled one mile) is primarily one of space capacity, and only as goods are assumed to have like specific gravity does it serve as an index of weight service.

It is evident that the utility of service, quantity remaining the same, varies according to speed, and certain branches of the freight service are differentiated on this basis. We have practically no statistics of the punctuality[1] and frequency of service, and but scanty ones concerning such elements as direction and commodity. It is of considerable importance to know not only how many trains are run, but also how many are run in a given period of time, say 24 hours; and comparisons might be quite inadequate without information on this point. Above all, however, it is essential to know something of the proportions in which the various commodities enter into the transportation product. The *utility* of the service varies considerably as between sand and sugar, or hay and packing-house products.

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[1] The New York Public Service Commission has compiled reports of number and percentage of trains on time and the average time late.

Then, at the end of the analysis of service, we must further observe that our unit of statistical judgment must be one which corresponds to service. If the transportation product which the railway furnishes society, and which is bought by the shipper, is the utility of moving so many pounds or tons from A to B, the ton-mile, not the car-or train-mile, must be the logical unit.

The relation between the service and the cost points of view is to be mentioned. That locomotive performance must vary with speed and direction; that expenditure affects frequency and convenience of service; that the cost to the shipper and the income to the carrier are related—all these things are apparent. As long as private ownership and operation exist, there is a distinction. The western politician may call for service, while the railway man considers his cost figures. But to the extent that the government undertakes administrative control or seeks to enlighten the public on more fundamental points, to that extent, of course, the private aspect of the railway property is joined with a public interest. This is but another way of saying that the cost, or net revenue point of view, is added to that of mere service.

The distinction between operating and traffic statistics is one which, as such, is of small importance to the public. But in a general way it is important to keep statistics of net and gross load separate. In a sense, the "tare" weight is waste transportation, and society is justly interested in reducing the proportion of "dead-weight." It is the tendency with railways in this country to develop further traffic statistics, and it would be well if our public statistics were to profit by this development. This is notably true in the case of commodity statistics.

Per-mile Statistics.—As the primary function of transportation is to move goods or persons from one point to another, thus involving distance, it is natural that the first thing to impress one in dealing with railway statistics is the frequency with which the word "mile" appears. Moreover, it is desirable to reduce statistical data to a comparable basis and consequently, whether service or net revenue be the point of view, railway statistics are largely reduced to a "per mile" basis—per mile of road, per mile of track, train-mile, etc. A mile of "road" or of "line" means a mile of roadbed, and each mile may, therefore, contain several miles of "track." A mile of track is only to be understood when it is remembered that there may be not only a first track but also a second, third, and other tracks. Consequently, there are more miles of track in a given railway system than there are miles of road or line. Track may include sidings and yard tracks, and it is often well to distinguish miles of "main track" from miles of all tracks.

In dealing with statistics on a per-mile basis, one should always be careful to remember that miles differ. A mile of road on one railway may be single tracked, while in the case of another road it may mean four tracks. In the former case, the roadbed may be 12 feet wide and in the latter 20 feet. The rails in one mile may be 50 pounds in weight and in another mile 120 pounds. There may be 14 ties to the rail in one case and 18 in the other; and one mile may be unballasted and the other have 12 inches of ballast under the tie. All this is to say nothing of the great variety in grades and curves which may exist as between the two miles. The average investment of one road per mile may be $60,000, while that of another road may amount to as much as $300,000. Obviously, it will not do to compare figures even on a per-mile basis unless due allowance is made for the different factors mentioned above.

Similarly, the movement of a train or a ton over a mile of road has a different meaning, depending not only on the kind of road over which the movement occurs, but also on the kind of train or the kind of commodity which makes up the ton.

Chief Statistical Units—The Train-Mile.—A much used unit in railway statistics is the "train-mile," which represents the operation of hauling a train one mile. At once, however, we note several serious difficulties in the use of the train-mile as a unit.

First proceeding from the cost or efficiency point of view, the question at once arises, "What is a train?" If one will reflect for a moment, he will recall having seen dozens of different lengths and types of train. A freight "train" is sometimes defined as an engine with a caboose. Another definition is "an engine with a train crew." Both have some utility, but also have their shortcomings. For our purpose a train may be defined as one or more locomotives and a varying number of cars.

So considered, it is apparent that some expenses are peculiar to the locomotive and have nothing to do with the number of cars. Such expenses include about 30% of the fuel and all the wages of the engineers and firemen. On the other hand, some of the expenses are peculiar to the cars, such as certain repairs and maintenance, and oil and waste. These items have no relation to the locomotives. Finally, the wages of the train crew and the remainder of the fuel expense depend upon the train considered as a unit.

Obviously, the train-mile unit can be a homogeneous thing, suitable for comparison only to the extent that the factors determining the locomotive expense and car expense are either similar or related, or else are negligible. Now these items are far from negligible, especially in the case of locomotive expenses, and accordingly all depends upon the kind and number of locomotives and cars in the trains which are compared. Trains differ widely in the number and size of their cars, in the percentage of dead-weight, and the number and power of locomotives. In a word, the train-mile is not a clearly defined unit.

It is especially important to note the percentage of tare or dead-weight. The number of locomotive-miles can be ascertained separately from the train-miles and when they largely exceed the train-miles we may conclude that grades and curves are such that the railway has to resort to "double headers," with a large mileage of pusher and helper locomotives. A glance at the Interstate Commerce Commission statistics will show that the ratio of train-miles to locomotive-miles on different roads varies from 50% to 99%.

As a unit of *service* the train-mile is not satisfactory for the general reason that what shippers want is not train-miles but ton-miles. An empty train makes as many train-miles as does a full train. To be sure, there is generally some relation between train-miles and ton-miles, but it is not close enough to be satisfactory.

More than this, from a service point of view, even if all trains were loaded, the difference in character of freight contained would vitiate comparisons on the basis of train-miles. The percentage of high-grade or low-grade freight in the trainload would vary. Also the percentage of carload freight and less-than-carload freight differs considerably, and this raises serious questions, of which two are: (1) How much more does it cost to handle a ton of less-than-carload freight? (2) Inasmuch as less-than-carload freight is actually weighed, while carload freight is often assumed to equal in weight the capacity of the car, to what extent are comparative trainload figures inaccurate?

The Locomotive-Mile.—As locomotive expense is a large part of the cost of running a train, it is natural that a great deal of importance should be attached to the average locomotive-mile as an operating statistical unit. The figure has its importance, but difficulties attend its use which are similar to those we have found in the case of the train-mile.

A great deal more must be known about the nature of the locomotive and the conditions under which it operates than is generally available, if the locomotive-mile is to be used in making comparisons as a unit for judging cost or efficiency. The following points may be especially mentioned:

1. Locomotives vary in type and accordingly in tractive power and operating expense. There is a wide difference between the effectiveness of "simple" and "compound" locomotives. Also, freight, passenger, and switching locomotives are quite different in their work and performance.
2. The locomotive may be running "light" or drawing a heavy load when it registers the locomotive-mile.
3. In determining locomotive expense time is often more important than distance and accordingly the locomotive-hour may mean more than the locomotive-mile. A large percentage of locomotive expense remains constant as long as steam is up; for fuel, wages, light repairs, and roundhouse expenses have little relation to distance.
4. The locomotive-mile gives little indication of the train resistances that are overcome in accomplishing the mileage, such resistances depending on grades, curves, speed, and weather conditions.

By making a supplementary analysis it is possible to overcome some of these difficulties in part. Thus, the mileage of freight, passenger, and switching locomotives may be obtained separately, and the light mileage is available. Little has been accomplished, however, in the way of allowing for the time element. Some English writers have strongly favored the engine-hour as a unit, but this makes no allowance for tractive power. Accordingly, it has been suggested that a "tractive-power hour" unit might be used which would make it possible to compare the quantity of motive power available per hour with the amount of work actually done.

A difficulty with this suggestion is that the number of locomotive-hours are not readily available. What we do have in the statistics published by the Interstate Commerce Commission are the tractive-power-pounds and the ton-miles (number of tons hauled one mile). Accordingly, the writer would suggest that the best available unit for comparing locomotive efficiency may be constructed out of these materials and be based upon the tractive power of locomotives rather than the number of locomotives. It is possible to compute for any railway the *ton-miles per average locomotive tractive-power*, the figure being a ratio between the average tractive-power-pounds per locomotive and the ton-mile. This unit, while it does not allow for time, would put the different roads on a more nearly comparable basis as to kinds of locomotives. Moreover, it is not so important to allow for time when the question involved is one of quantity or work done or service rendered, but rather the question concerns the ton-miles made (that is, the number of tons hauled one mile). Consequently, the proposed unit, namely, the "ton-miles per average locomotive tractive-power" should give fairly satisfactory results.

The Car-Mile.—A "car-mile" is a unit which represents the movement of a car over the distance of one mile, and the number of car-miles is found by adding the mileages made by each car. As a unit of *cost,* the car-mile has its value, but here again there is considerable difficulty in allowing for variable factors which limit its use. It requires a great deal of interpretative data to avoid falling into error in making comparisons.

For example, cars vary so in cost and type and capacity that when the figures are quoted "per car-mile" one is inclined to ask, "What is a car?" The proportion of dead-weight, or tare, varies widely. For example, a small wooden car has a weight which is a large percentage of the freight it will carry, while a large steel car when loaded makes a smaller percentage of dead-weight.

Again, the car-mile may be one made by an empty car, or it may represent the movement of a car loaded to capacity, with all degrees in between. In 1920 nearly one-third of all freight-train car-miles were empty miles. Moreover the average carload for different lines may range between 8 and 65 tons.

Finally, car resistance varies according to the number of cars in a train, the speed at which they move, and the grades and curves which impede their progress.

In a word, there is nothing to insure that car-miles and operating expense will vary proportionately or even in the same direction. If a road increases its average carload, or hauls a smaller percentage of empty cars, or makes more miles per car-day, it may increase its car-miles considerably and at the same time actually reduce its operating expense. Consequently, the car-mile furnishes too uncertain a basis for determining operating policies, and it would be unwise to base public regulation upon it.

As a statistical unit for judging *service* performed by a carrier, the car-mile may be more satisfactory, although even here some analysis is necessary to allow for the different average capacity of cars, the kind of commodity with which they are loaded, and the speed and direction in which they move. After all, what the public wants is not car-miles but ton-miles.

From the operating point of view, however, car movement is of such importance that it is neither possible nor desirable to abandon car-mile statistics. Consequently, we should note here the available figures for correcting or allowing for the difficulties that have been pointed out. (1) It is possible to know and make allowance for the difference in average capacity of cars. (2) We know the percentage of car-mileage that is made by empty cars, (3) gross ton-miles (including the weight of the car) are reported separately from net ton-miles. (4) Finally, the government publishes the average car-miles per day, which gives an indication of the average speed made, and the average number of cars per train. Taking all these things together, one can make a fairly good use of car-mile figures by allowing for the various factors which otherwise invalidate comparisons.

The car—and accordingly the car-mile—is best regarded as a potentiality. It is a unit of capacity, not of actual performance or service. It is important to know a railway's capacity and the measure in which it is utilized. It is highly important to know the average carload, the empty car-mileage, and its percentage of the total, the car-miles made per day and the ton-miles per car day. All of these are available in the statistical publications of the Interstate Commerce Commission.

The Ton-Mile.—The ton-mile is the most generally used unit of statistical judgment, both as regards railway cost and railway service. What, then, is a ton-mile? A ton-mile is generally referred to as one ton hauled one mile. This statement is slightly misleading, as it seems to imply something concerning the size of shipments, and it might be better to say that ton-miles are the number of miles that tons are hauled.

A ton-mile represents the movement of a ton over a distance of a mile. Thus one ton hauled 10 miles equals 10 ton-miles and also 10 tons hauled one mile equals 10 ton-miles. Needless to say, 5 tons hauled 2 miles give the same result in ton-miles. The idea behind the ton-mile is that it expresses in itself both tonnage and distance, and thus well represents the work done by a railway. The ton-mile is analogous to the "foot-pound" of physics.

There is, indeed, a great deal to be said in favor of the ton-mile as a statistical unit. But first it will be well to point out its limitations. As a unit of judgment of efficiency or *cost* it must be admitted that operating expense does not necessarily vary with total ton-miles, and this for several reasons:

> 1. Ton-miles have different significance according to the kind of commodity, and a ton of fruit has a very different relation to cost from that of a ton of coal. Different commodities require different speeds, present different risks, and have different costs of loading and handling in transit.
>
> 2. The distance involved affects the meaning of the ton-mile. A ton-mile which is one of a large number of tons hauled a short distance may be much less desirable from the railway point of view than another ton-mile which is one of a smaller number of tons hauled a long distance. Terminal expenses are considerable and they do not vary with the distance. Accordingly, a short haul may not furnish enough revenue to cover the bare expense of loading and unloading the goods.
>
> 3. The amount of handling required is a variable which is not allowed for in ton-mile statistics. As will later be found, there is much difference between carload freight and less-than-carload freight. Here it is only to be noted that less-than-carload freight requires much more handling by the railway and consequently involves greater expense. The same may be true of local freight as against through freight.

> 4. The amount of competition which affects the business makes the importance of various ton-miles differ somewhat. This is illustrated by the great difference beween export grain traffic and local merchandise shipments, the former meaning a ton which is one of many thousands shipped in carloads in competition with similar shipments all over the world, while the latter is part of a relatively small and irregular business, subject to a large degree of monopoly power by the single carrier which can perform the service.

Even as a unit of *service* the ton-mile is not perfect in itself, as the utility of the ton-mile produced by the railway will vary with the commodity, the speed, the direction, and other factors. It is important here, too, to note that we must distinguish the gross ton-mile from the net ton-mile. While the former includes the weight of the equipment, as well as the freight, the latter means only the revenue freight, and it is with this alone that a statistical unit for measuring service is concerned.

With all its faults the ton-mile is the best statistical unit. It is the most logical and generally applicable basis for studying railway operation and service. For one thing, it is an excellent common denominator in that it is equally available for judging cost and service, or operation and traffic. It is equally valuable for studying efficiency and profits. The service that the railway affords is tons hauled from one point to another. In performing this service its motive power is rated and its trains are made up on a tonnage basis. Its terminal expenses, too, vary with the tons hauled, and while tons are not ton-miles, there is at least some connection between the two.

The ton-mile is the easiest statistical unit to use. It is easy to define and relatively easy to enumerate.

With a little care to get and use certain statistical data it may be made a reasonably accurate basis of statistical judgment. The most important available factors which are needed to supplement the ton-mile are the following:

1. Total ton-miles should be distributed into gross ton-miles and net ton-miles.

2. It is most important that commodity statistics should be available so that ton-miles can be analyzed by commodities. The Interstate Commerce Commission gives commodity groups, but these have to be broken up still further to be entirely satisfactory, for reasons that are clear when it is noted that the "agricultural" group includes both fruit and hay, while the animal products group includes both fertilizers and "packing-house products," such as lard.

3. The percentage of carload and less-than-carload freight should be taken into consideration.

4. Data showing the length of haul are important.

5. Local versus through freight. The Interstate Commerce Commission statistics enable one to ascertain the proportion of the tonnage of a road which originates on its own line. This is not entirely satisfactory, as it does not enable us to tell where the tonnage shipped terminates, but it helps towards a better understanding of the ton-mile figures.

6. In interpreting ton-mile figures one should also consider the density of traffic.

CHAPTER IV

RAILWAY OPERATING AND TRAFFIC STATISTICS
(CONTINUED)

Traffic Density.—An important statistical average is "ton-miles per mile of road." This figure is arrived at by dividing the number of miles of road into the total number of ton-miles, and may be expressed by the following formula:

$$\text{Traffic density} = \frac{\text{Ton-miles}}{\text{Miles of road}}$$

This unit of traffic density may be a very good statistical device for indicating physical volume. Taken together with the operating ratio it furnishes a fair index of railway efficiency, but for one who is interested in railway earnings and finance it requires careful interpretation.

In the first place, its significance varies materially with the kind of traffic—with the kind of tons in the average ton-mile. The kind of traffic may change and therefore the density of traffic may also vary in its significance. Two roads may have equal density of traffic—one hauls logs and iron ore and the other fruit and automobiles. Which road makes the most money? Certainly the density of freight traffic does not tell.

In the second place, density may be achieved at disproportionate expense. For example, the Erie Railway has had a rather high traffic density but this has generally been secured by hauling many cars each one of which has a relatively small load. The result is a greater operating expense than that of some other roads which have less density but larger average carloads. Consequently great density on the Erie may not be an advantage.

In the third place, the kind of road affects the meaning of the density figure. An expensive and possibly highly capitalized railway will require a large volume of traffic in order to make any kind of a showing; while a cheaply constructed line may make good returns from a relatively sparse traffic.

On the whole, however, the "ton-miles per mile of road," or freight traffic density, is one of the most valuable statistical units, and if due allowance is made for the variable factors which have been referred to, it is of great use in making comparisons among different railways and among the different years of a single railway.

Per-mile Statistics in General.—All per-mile statistics are dangerous. A large part of the trouble in finding satisfactory railway statistics lies in the mile, whether it be mile-of-road, car-mile, locomotive-mile, train-mile, ton-mile, or passenger-mile. There are two great difficulties which cover most of the problem.

In the first place, miles lack homogeneity. They are not the same in at least four important respects.

1. They vary in place, miles being different on different divisions of the same road and on different roads.
2. They vary in time, and accordingly all the fluctuating conditions of business and climate which affect railway operation and traffic have to be considered.
3. In the case of movement miles, they vary in their rate of speed and this variation affects even the maintenance of the miles of road.
4. Miles vary in their quantity or the extent to which they are aggregated. Thus two roads having the same ton-mileage may show very different results according to the

average length of haul per shipment and to the density of traffic.

In other words, as already observed, a ton-mile means most when it is one resulting from a large amount of mileage in proportion to tonnage, which shows long average hauls. Also, as a general thing, a ton-mile which is one of a large volume per mile of road means more than one which is part of a less dense traffic.

In the second place, per-mile statistics are often misleading in judging efficiency, because *important items of expense and net revenue do not have any relation to miles.* A large part of railway wages are paid by the hour. Fuel consumption, to a very considerable extent, depends upon time and not upon the miles made. Depreciation, both of way and structures and in part of equipment, has little relation to movement miles, though, of course, the total amount of depreciation of way and structures has a close relation to miles of road. To cap the climax, *the important item of terminal expense has nothing whatever to do with miles,* and the shorter the haul, the more controlling these terminal expenses become.

Correct Use of Per-Mile Units.—The reader must not think because the difficulties are pointed out that the per-mile statistical units are therefore useless. It is with a constructive purpose that the foregoing criticisms are made. Statistics are constantly subjected to criticism because of the erroneous conclusions which result from their careless use and it is only by understanding the necessity for a correct utilization of statistics that error can be avoided.

What is often most needed is that the shortcomings of a given statistical unit should be removed by bringing in some other element to supplement it. When, therefore, it is pointed out that miles vary in time, rate, and quantity, we must conclude that in using per-mile figures they must be supplemented by presenting figures that will enable us to allow for these variables. For example, if we are presenting a column of figures showing the train-miles or ton-miles for a series of years or for a series of different railways, we can present in parallel columns figures showing the average trainload, the density, the average length of haul, the average car-miles per day, etc.

In any event, the knowledge of the pitfalls of railway statistics will be valuable to anyone who desires to get the true meaning from a statistical statement concerning railways.

The chief use of per-mile of line figures comes in presenting data concerning capitalization, revenue, expense, and net revenue. Here the mile furnishes a valuable unit for facilitating comparisons. It is of little value for comparing the *efficiency* of operations, for railways are built to allow the movement of traffic and there must, of course, be a certain number of miles of road to connect any two points. The traffic may be heavy or light; and the transportation expenses do not depend on the number of miles of road. Only the maintenance-of-way expenses depend directly upon the number of miles of road and even here the density of traffic plays a part. But the investment per mile of road is a figure of value. The reason for a difference in the investment per mile for any two roads may lie in the kind of roadbed and track; but the fact remains that one or the other of the roads has a greater investment per mile, and that is important in itself. It means that the net earnings must be proportionately greater if capital is to receive the average return.

Similarly, the "net revenue" per mile of line is important. The fact that the net earnings per mile are small does not in itself show the reason for the smallness, nor necessarily indicate the relative efficiency of operation. It merely furnishes an index of the profitableness of railway operations which enables us to make an initial comparison between long and short roads. From this point of view it is worth while to show comparative net earnings per mile of road, though we must remember that it is important to supplement the comparison by a knowledge of the volume of traffic handled, and that we can only *explain* the differences shown by knowing something of the relative technical efficiency of the roads compared.

The Operating Ratio.—An important, though much abused, statistical unit is that known as the operating ratio. This figure is the percentage of operating expenses to gross earnings from operation. In other words, it is the percentage of a railway's revenue which is paid out in operating expenses. The operating ratio, which in the past has normally averaged in the neighborhood of 65% on American railways, is at present in the neighborhood of 78%, as a result of abnormal traffic and operating conditions.

As already stated, the operating ratio is a much abused unit of statistical judgment. For several years following the peak of the prestige of the Hill roads in the Northwest, the policy of securing large trainloads and low operating ratios became a sort of fetish with railway men, and some seemed to believe that the lower the operating ratio the better. At first glance it does seem that the smaller the percentage of operating expense the better. Let us then examine carefully the exact significance of this ratio.

As a unit of *service,* the operating ratio has little if any significance. Its validity must depend upon its value as an operating or cost index. Considered even from the *cost* point of view, however, we find it apt to be quite misleading. In the first place, neither element in the operating ratio depends closely upon efficiency of operating. Obviously, the *gross* earnings do not depend upon operating efficiency, but merely upon the tonnage hauled and the freight rate. Nevertheless, the operating ratio is half dependent upon gross earnings. Again, a large part of operating expenses, which make the other side of the ratio, does not depend on operating efficiency. A very considerable fraction of operating expenses depends upon *weather conditions* and inevitable depreciation, especially the maintenance of way and structures. To some extent, such expenses are even yet dependent upon the policies of boards of directors. Perhaps this item amounts to as much as from 10% to 15% of all railway operating expenses. How, then, could the operating ratio furnish a certain index of operating efficiency?

In the second place, the operating ratio gives no indication of the volume of traffic that is handled. Two roads of similar length and operating efficiency, one of which handles a million tons and another two million tons, might have exactly the same operating ratio. But the total net earnings of the road with the larger traffic would be far greater than those of the other. Just as in mercantile business a large volume at a low margin may be more profitable, so in the railway business the road with the dense traffic and high operating ratio (or low margin per unit) is generally the one that is most profitable. Thus the ratio is not a good index of profitableness.

For example, although it may be expensive, it may pay to rush empty cars over the line at a good rate of speed, in order to get more traffic. It is traffic that pays. But an operating official who is dominated by the idea of the operating ratio might wait for a heavy trainload, thus reducing his average operating expense per mile traveled by trains but also losing business. Concrete illustrations of the lack of significance of the operating ratio will be found in the comparisons shown in the table below, showing operating ratio and net operating revenue per mile for certain selected roads in 1917. The figures are based on the year 1917, when ratios were more nearly normal than they now are.

Railway Company	Operating Ratio	Net Operating Revenue per Mile
Maine Central	76%	$ 2,835
Pennsylvania	79	12,002
Yazoo and Mississippi Valley	69	4,111
Erie	86	5,110
Missouri, Kansas, and Texas	72	2,591
Chicago and Great Western	76	4,148
Northern Pacific	60	5,355
Union Pacific	64	8,571

The foregoing figures show that in important cases the road which has the lower operating ratio does not have the higher net earnings. Also, that there is no direct relation between the amount of the operating ratio and the amount of net earnings. Thus the Union Pacific railway, the operating ratio of which is 4 points above that of the Northern Pacific, had net earnings per mile of road considerably greater; while the Pennsylvania Railroad, with an operating ratio only 15 points over that of the Union Pacific, had a net revenue 40% greater.

But many cases can be found in which the operating ratio does supply an index of operating efficiency, and it will be found that this is generally true when comparing roads of the same general class. We may, therefore, draw the final conclusion that within a given class of railways the operating ratio supplies a crude index which has considerable value, but that it is liable to abuse and requires supplementary statistics for its interpretation.

Eleven Chief Statistical Units.—In order that one may have a background for dealing with railway statistics, it is highly desirable that one should have in mind at least a few typical figures. Without this one does not know an important figure when he sees it. One reads that the average density of traffic is 1,000,000 ton-miles or that the average carload is 24 tons, and although both figures are of great importance they mean nothing unless one has in mind some typical figure.

Accordingly, there is presented next a table which shows typical figures covering eleven important statistical units.

IMPORTANT AVERAGES IN THE RAILWAY STATISTICS OF THE UNITED STATES

	1917	1922
1. Ton-miles (net) per mile of line.........	1,698,000	1,431,000
2. Tons revenue freight per train...........	597	677
3. Tons revenue freight (net) per loaded car.	24.7	26.9
4. Revenue passengers per train.............	65	66
5. Percentage of loaded car mileage.........	70%	67%
6. Average miles per car per day...........	26.1	23.5
7. Average revenue per ton-mile...........	.715c	1.176c
8. Average revenue per passenger-mile.......	2.09c	3.028c
9. Operating ratio.........................	70.4%	79.3%
10. Net operating revenue per mile of road..	$5,095	$4,938
11. Capitalization per mile of road...........	$66,696	$67,170 (1919)

In addition to the foregoing it may be well to keep in mind that for many years approximately 70% of the earnings of the railways of the United States have on the average come from the freight service.

Comparison of Two Roads.—In order to make these figures mean more and to illustrate their application, it will be of interest to make a comparison between two different roads, and for that purpose we shall take the Baltimore and Ohio and the Erie, comparing the results obtained by their managements during the year 1917. The following table shows several interesting points with regard to railway statistics.

COMPARISONS OF OPERATING AND TRAFFIC STATISTICS
BALTIMORE AND OHIO AND ERIE RAILWAYS

PER MILE OF ROAD:	Baltimore and Ohio	Erie
Net revenue	$6,476	$5,110
Operating Expense	$21,809	$30,575
Capitalization	$82,000	$84,000
TRAFFIC DENSITY:		
Ton-miles per mile	3,633,000	4,381,000
Freight-train-miles per mile	4,586	5,573
PER TON:		
Revenue per ton-mile	$.00596	$.00617
Average haul	196	208
Per cent originating on road	40%	32%
PER TRAIN-MILE:		
Net revenue	$0.78	$0.53
Operating expense	$2.63	$3.14
Revenue tons per train	777	773
Loaded cars	27	31
Empty cars	11.6	12.2
PER LOCOMOTIVE-MILE:		
Freight-train-miles per locomotive-mile	.78	.85
Ton-miles per average locomotive-tractive-power	432,000	224,000
PER CAR-MILE:		
Average revenue tons per car	30	25
Per cent loaded car-miles	69%	72%
Car-miles per car day (1921)	22	32
OPERATING RATIO	77%	86%

At a glance one notices that the net revenue per mile of road of the Baltimore and Ohio was greater than that of the Erie by over $1,000. This is quite consistent with the fact that the Erie had a much greater operating expense per mile together with a higher operating ratio. The Erie's situation was relatively worse because of its greater capitalization per mile of road.

But as one looks down the columns it is noted that the important figures showing traffic density seem to indicate that the Erie had a considerable advantage over the Baltimore and Ohio. Both roads had fairly dense freight traffic, but the Erie's figure was over 700,000 ton-miles greater than that of the Baltimore and Ohio, and its train-miles per mile of line also made a more favorable showing. Other points which were possibly in the Erie's favor were its higher revenue per ton-mile, its longer average haul, and its higher percentage of loaded car-miles. It also made a greater freight train mileage per locomotive-mile, indicating that it required a smaller quantity of helper and pusher locomotive service. How, then, can it be that the Erie made a less favorable showing as to its net revenue?

The answer is to be found in two points: first, in its smaller carload with the resulting smaller trainload; and second, its greater operating expense per train-mile which an examination of other statistics shows to have been due to heavier repair bills for locomotives and cars, and higher fuel cost.

The most interesting of these points is the difference made by the smaller number of tons per car, the Erie only having 25 as against the Baltimore and Ohio's 30. The Erie actually had a higher average number of "loaded cars" per train than did the Baltimore and Ohio; yet because its cars did not contain so much freight, the average trainload was somewhat less than that of the Baltimore and Ohio. Not only this, but the smaller carloads meant a larger proportion of tare or dead weight, and a greater expense per unit of revenue, which was reflected in the higher operating ratio. The Erie made more ton-miles and train-miles per mile of road, but it made this showing by hauling an unnecessarily large number of cars and trains.

Perhaps because its equipment had been allowed to get into bad shape, its repairs were relatively great, and whatever the reason, its cost of fuel for locomotives was higher in proportion to performance than that of the Baltimore and Ohio. Consequently, its net revenue per train-mile was only 53 cents as against 78 cents for the Baltimore and Ohio.

While the Baltimore and Ohio got a smaller number of car-miles per car-day, it had so much larger carloads that it made the better showing.

Commodity Statistics.—In discussing ton-mile statistics the importance of considering the kind of commodity in the ton

Commodity	Revenue Freight Originating on Respondent's Road
	Number of Tons (2,000 lbs.)
Products of Agriculture: Total	111,782,598
Wheat	24,802,796
Corn	19,275,378
Flour and meal	10,695,121
Other mill products	9,000,627
Oats	7,646,848
Hay, straw, and alfalfa	5,722,058
Other grain	5,245,341
Other fresh fruits (than citrus)	5,063,954
Animals and Products: Total	26,234,896
Cattle and calves	9,571,435
Hogs	5,795,062
Products of mines: Total	532,398,943
Bituminous coal	287,235,288
Clay, gravel, sand, and stone	102,677,414
Iron ore	52,739,885
Anthracite coal	48,823,014
Coke	15,437,961
Other ores and concentrates	9,677,415
Crude petroleum	5,935,997
Products of Forests: Total	89,071,085
Lumber, timber, box shooks, staves and headings	43,512,275
Logs, posts, poles and cord wood	35,633,637
Manufactures and Miscellaneous: Total	220,445,310
Refined petroleum and its products	30,863,324
Bar and sheet iron, structural iron, and iron pipe	22,168,863
Cement	18,454,450
Brick and artificial stone	15,606,849
Iron, pig and bloom	9,991,387
Chemicals and explosives	7,535,197
Fertilizers (all kinds)	6,817,946
Ice	5,208,853
Lime and plaster	5,192,614
Sugar, syrup, glucose, and molasses	5,091,438
Merchandise—All L.C.L. freight	43,176,746
Grand Total—Carload and L.C.L. traffic	1,023,109,578

Fig. 5.—Summary of Freight Commodity Statistics of Class I Roads for the Year ended December 31, 1922, showing Chief Commodities Hauled

was mentioned. Commodity statistics are very necessary. Fortunately the Commission compiles them quarterly in some detail. From this source comes the table in Fig. 5, showing the most important items in railway tonnage.

Mines furnish the largest tonnage, with bituminous coal leading. Few persons realize how large a tonnage consists of anthracite coal and petroleum products.

Probably no uninformed person could answer correctly the question, What commodities yield to the railways the highest and the lowest revenue per ton? The average revenue per ton in 1922 is shown for 10 commodities in the following table based on 1922 tonnage at 1923 rates:

HIGH REVENUE COMMODITIES		LOW REVENUE COMMODITIES	
Poultry	$34.74	Logs and posts	$0.96
Citrus fruit	31.20	Clay, gravel and sand	1.03
Automobiles	25.27	Ice	1.13
Eggs	24.49	Iron ore	1.33
Non-citrus fruit	23.49	Other ores and concentrates	1.83

It is obvious that the commodities which yield the lowest revenue per ton are among those which move in the largest volume, and vice versa.

The average revenue per ton was $3.67 for carload freight and $7.23 for less-than-carload freight. Wheat averaged $4.82 per ton.

Seasonal Variation and Normal Growth in Railway Freight Traffic.—One of the most important requirements for the correct handling and interpretation of railway statistics is due allowance for the usual seasonal variation that is found in railway traffic and earnings. It is also important in some cases to make allowance for the normal growth in traffic.

The author has determined that normally railway tonnage varies from month to month each year in approximately the ratios shown in Fig. 6.

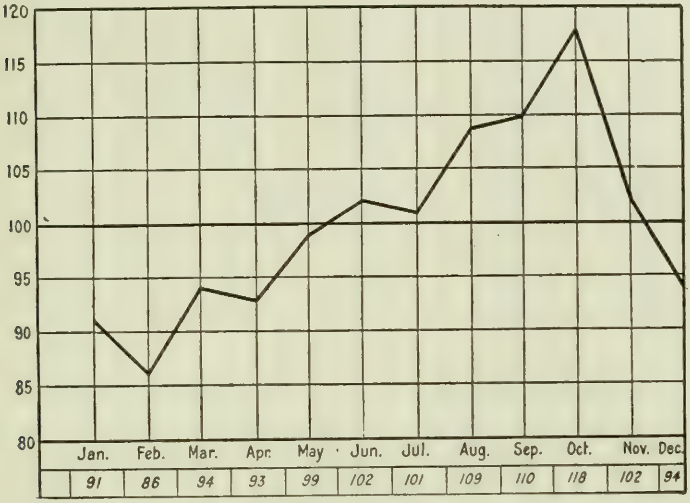

Fig. 6.—Normal Seasonal Variation in Railway Tonnage
(Monthly average of year = 100)

The outstanding facts are that the traffic usually reaches a peak in October and falls to its minimum in the short month of February, with an irregular ascent and descent between the two months. This is chiefly attributable to the large volume of grain and coal in the autumn months.

Car Loadings as Index of Traffic.—The most readily available index of railway traffic is the number of cars loaded, which is ascertained weekly by the American Railway Association. How closely this figure corresponds to the usual variation in tonnage appears in the graph in Fig. 7, showing total weekly carloadings and the number of cars short of requirements, surplus cars, and bad-order cars for three years.

The only difference between the trend of cars loaded and

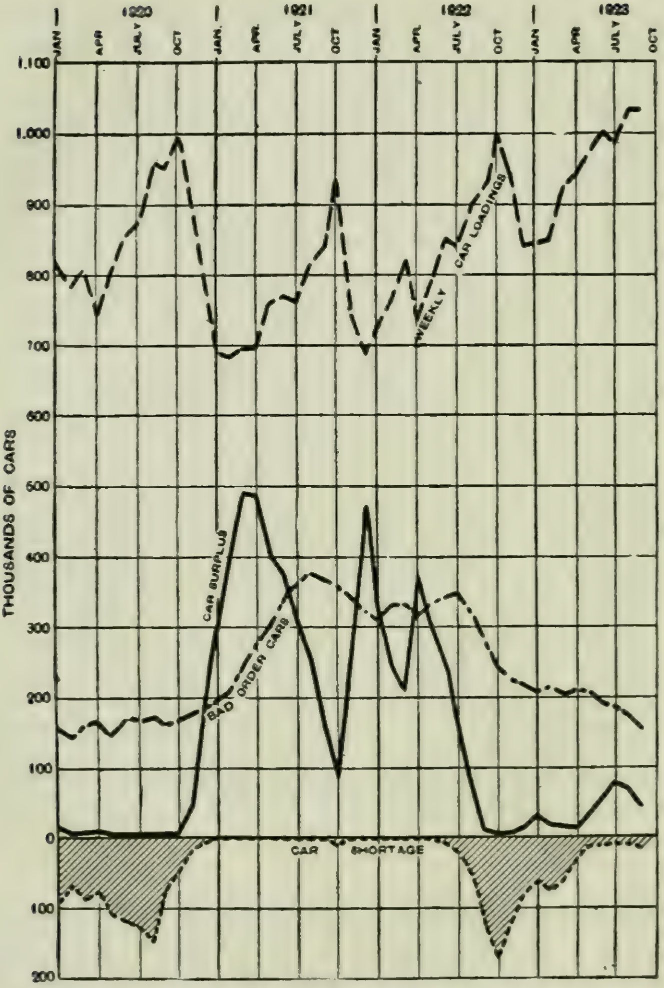

Fig. 7.—Shortage, Surplus, Bad-Order, and Total Loadings of Freight-Cars

the tonnage lies in the varying number of tons per car. The size of the carload varies from month to month and from year to year, as appears in the following table, which shows a range of from 25 tons to 31.2 tons:

NET TONS PER LOADED CAR

Month	1919	1920	1921	1922
Jan.	29.0	28.3	30.2	27.6
Feb.	27.7	28.3	28.4	28.3
Mar.	27.6	28.1	27.2	27.7
Apr.	27.3	28.3	26.9	24.4
May	27.6	28.2	27.7	25.0
June	27.5	28.8	27.6	25.4
July	27.8	29.5	27.5	25.0
Aug.	28.0	29.8	27.4	26.3
Sept.	28.3	30.0	27.1	27.3
Oct.	28.0	29.9	27.3	27.7
Nov.	26.2	30.5	27.2	28.2
Dec.	27.7	31.2	26.8	28.6

By taking the product of cars loaded and tons per car, a close approximation to total tons hauled may be secured month by month. This figure can then be "corrected" for seasonal variation by reducing it to the form of an index number and taking the ratio between it and the normal seasonal index.

Estimating Annual Rate of Earnings.—One of the applications of the idea of seasonal variation is in estimating the annual rate of net earnings from the returns of a single month. If 5.4% of the railway's annual earnings usually are made in February, and the actual February earnings are $540,000, then the earnings are at an annual rate of $10,000,000. The per cent on investment can then readily be computed. The normal monthly percentages that the net earnings of each month bear to the whole year, as determined by the Bureau of Railway Economics, are:

Jan.	5.7%	July	8.9%
Feb.	5.4	Aug.	10.4
Mar.	7.5	Sept.	10.8
Apr.	6.7	Oct.	11.2
May	7.4	Nov.	9.4
June	8.4	Dec.	8.2

Estimating Normal Growth of Traffic.—The rate at which railway tonnage has grown during a series of years gives us the basis for estimating normal growth. The facts are shown in the graph in Fig. 8, which shows at a glance that there has been a fairly regular upward trend both in tons and in ton-miles.

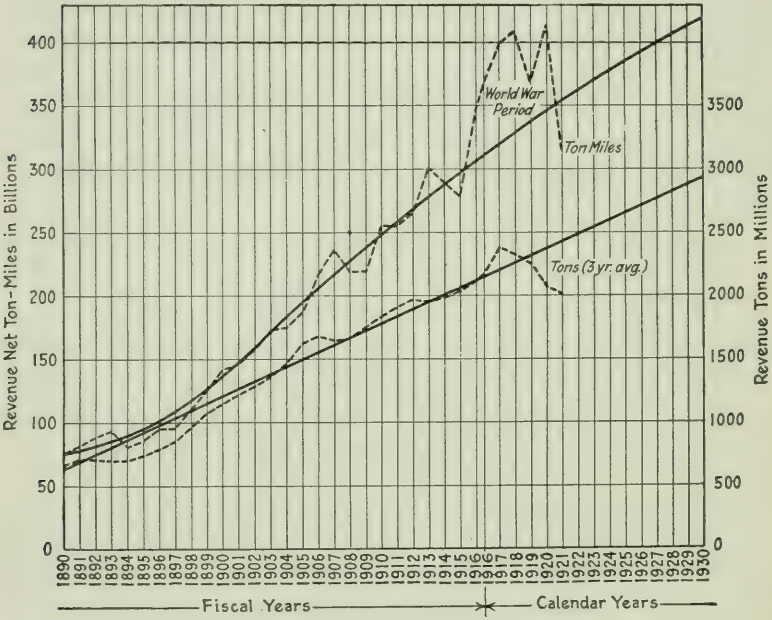

Fig. 8.—Chart Showing Upward Trend of Traffic since 1890
(The ton-mile curve is taken from a graph prepared by the Bureau of Statistics of the Interstate Commerce Commission.)

Whether the trend of normal growth is best indicated by a straight line or by a curve as shown in the graph, is not clear. In general it may be said that total tonnage has grown at an average rate of about 59,000,000 per year, and that ton-miles have increased at the rate of about 9,375,000,000 per year. The growth in tons has been less rapid than that in ton-miles, which reflects the fact that down to 1922 the average haul increased in length. This may be due partly to a loss of short-haul business to motor trucks and partly to a larger proportion of eastbound transcontinental traffic. In the future it is not unlikely that the rate of normal growth will be somewhat less rapid. The upward trend during the last ten or twelve years has not been so sharp as it was on the average from 1890 to 1914, and traffic will have to increase greatly if it is to come up to the old line of normal growth. This whole question is of importance in forecasting traffic.

Traffic as Related to Production.—How closely railway tonnage is related to the total volume of production is shown in the graph in Fig. 9, which compares an index number of railway tonnage from which seasonal variation has been eliminated, with indices of production in basic industries and in manufactures prepared by the Federal Reserve Board.

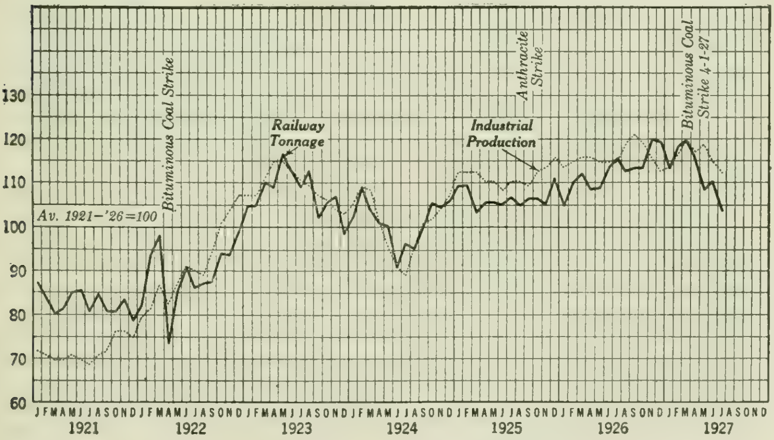

Fig. 9.—Railway Tonnage and Production in Industry

Railway tonnage and basic industries production corrected for seasonal variation.

CHAPTER V

RAILWAY ACCOUNTS, REVENUE, AND EXPENSES

Importance of Railroad Accounts.—It is impossible to get at the vitals of any business without some knowledge of its accounting methods and of its chief sources of income and expense which the accounts show. A short discussion of railway accounts is, therefore, of interest and importance. It will give a better knowledge of the railway business and its various phases; it will be of practical value to the investor in railway securities and to students of railway statistics; and it will both throw light on the trend of some special problems of public utility accounting and show how important accounting control is in connection with the regulation of railway rates and in protecting railway credit.

Railroad Accounting System.—We will not go into the history of the steps by which the Interstate Commerce Commission came to exercise greater and greater control over railway accounting. Suffice it to say, that since 1907 the railways have been required to keep their accounts according to a system drawn up by the Interstate Commerce Commission after much conference with the accounting officers of the carriers. The accounts must be uniform and no books are allowed except those approved by the Commission. In 1914 the Commission put out a revised classification of accounts and greatly strengthened its control over accounting matters.

The main headings of the Commission's accounting system for railways are shown in the following outline, together with the approximate average percentages which the several items form of their respective totals. The outline will give the reader a bird's-eye view of the whole system, showing how the various items of revenue and expense are brought together in the income account, how the income account leads up to a gain or loss, which in turn is transferred to the profit and loss account, and how the surplus or deficit shown by the profit and loss account is finally transferred to the balance sheet which shows the assets and liabilities at the time when it is drawn up.

REVENUE AND EXPENSE

Operating Expense	Approximate % of Total
Maintenance:	
Way and Structures	17.0
Equipment	26.0
Traffic	2.3
Transportation:	
Rail Line	50.0
Water Line	.3
Miscellaneous Operations	1.2
General Expense	3.5
Total	100.3
Deduct—Transportation for Investment *	−.3
Total	100.0

Operating Revenue	Approximate % of Total
Transportation:	
Rail Line:	
Freight	70.0
Passenger	20.0
Express	2.7
Mail	1.6
Other	2.9
Total	97.2
Water Line:	
Freight	.3
Passenger	.04
Other	.01
Total	.35
Incidental:	
Demurrage	.5
Dining and Buffet	.5
Other	1.5
Total	2.5
Joint Facility:	
Debits	−.03
Credits	.14
Total	.13
Total Operating Revenue	100.00

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* Transportation of company freight chargeable to capital account.

INCOME ACCOUNT

+ Railway Operating Revenue (as above)
− Railway Operating Expense (as above)

Net Railway Operating Revenue
− Taxes (Railway Tax Accruals)
− Uncollectable Railway Revenues

Railway Operating Income
+ Miscellaneous Operating Income

Total Operating Income
+ Non-operating Income (hire of freight cars, rents, profit on separately operated properties, dividend income, etc.)

Gross Income
− Deductions from Gross Income (rents and interest paid, loss on separately operated properties, income transferred to other companies, etc.)

Net Income
− Disposition of Net Income (appropriations for reserve funds, dividends, etc.)

Balance transferred to Profit and Loss

PROFIT AND LOSS ACCOUNT

Debits	*Credits*
Debit Balance (beginning of period)	Credit Balance (beginning of period)
Balance from Income Account (if a deficit)	Balance from Income Account (if a surplus)
Appropriations of Surplus (dividends, investments in physical property, etc.)	Profit on Road and Equipment Sold
Loss on Retired Road and Equipment	Delayed Income Credits
Delayed Income Debits	Unrefundable Overcharges
Miscellaneous Debits	Donations
	Miscellaneous
Total	Total

Balance carried to Balance Sheet

Balance Sheet (Condensed)

Assets	Approximate % of Total
INVESTMENTS:	
Road and Equipment	65.0
Sinking Funds	0.1
Investments in Affiliated Companies	16.5
(Other items	5.4)
Total	87
CURRENT ASSETS:	
Cash	.5
Special Deposits	.25
Materials and Supplies	.03
Miscellaneous Accounts Receivable	2.6
(Other items	.62)
Total	4.0
DEFERRED ASSETS:	7.4
(Working fund advances, etc.)	
UNADJUSTED DEBITS:	
Discount on Capital Stock	
Discount on Funded Debt	
Other Unadjusted Debits	1.3
Total	1.6
TOTAL ASSETS	100

Liabilities	Approximate % of Total
STOCK:	
Capital Stock	
Premium on Capital Stock	
Total	31.0
GRANTS IN AID OF CONSTRUCTION	.02
LONG-TERM DEBT:	
Funded Debt Unmatured	38.8
Receiver's Certificates	.075
Non-Negotiable Debt to Affiliated Companies	.1
Total	40.0
CURRENT LIABILITIES:	
Loans and Bills Payable	1.7
Interest Matured Unpaid	
Funded Debt Matured Unpaid	
Dividend Matured Unpaid, etc.	
Total	4.2
DEFERRED LIABILITIES	7.8
UNADJUSTED CREDITS:	
Premium on Funded Debt	
Operating Reserves	
Accrued Depreciation	3.6
Other Unadjusted Credits	1.6
Total	5.3
CORPORATE SURPLUS (reserves, profit and loss balance, etc.)	11.7
TOTAL LIABILITIES	100

Operating Expense—Maintenance.—At least five main divisions of the Commission's accounting system may be distinguished, which will be discussed in the following order: operating expense, operating revenue, income account, profit and loss account, investment in road and equipment (in the balance sheet).

Under the heading of "operating expense," it is probably safe to say that the chief problems have concerned the item of "maintenance" which covers repairs, depreciation, and replacements of railway property. Often expenditures under these heads do not have to be made at any particular time but may be hastened or postponed. Consequently the amount expended during any given period is more or less optional and a matter of policy. Moreover, maintenance expenditures may be more than sufficient to maintain the value of assets and may result in the building up of a surplus reserve in the property.

Depreciation.—Two great improvements in maintenance accounting have been made by the Interstate Commerce Commission. The first of these concerns "depreciation." Formerly the railways generally kept only two accounts—"repairs" and "replacements and renewals." Thus, no clear-cut allowance was made for mere depreciation, which is the cost of wear and tear of plant and equipment; and the expenditures for replacements made might be more or less than what would be required to cover such wear and tear. This resulted in a confusion of capital and income, and, on the one hand, investors were often injured by charging the additions to capital; while, on the other hand, the public was injured through a showing of incorrect expenses by padding costs with "additions and betterments" that should have been charged to capital account, the practice resulting in higher rates.

The Commission, however, has not yet prescribed the rates of depreciation which may be charged on different classes of railway property and considerable latitude accordingly exists in the amount of depreciation charged. In retiring old equipment, also, the railways can exercise their own judgment and by early retirement or prolonged use they can, to some extent, determine the life of their equipment and thus affect depreciation charges.

"Joint Facility" Accounts.—The second great improvement which affects maintenance accounts lies in the handling of "joint facility" accounts. When two or more railways use the same terminal or track, the original charge for maintenance of such terminal or track is made in the books of the company which owns or is responsible for the property. The other road or roads are charged for the use of the property, and the payment received by the owner road is carried to its "joint facility" account as a credit. The road or roads which make the payment debit their joint facilities accounts. Thus, a correct statement of the total operating expenses of all railways is preserved, while formerly there was often a duplication from adding together the maintenance expense of the owning road and the rental expense of the road hiring the use of the property.

In this connection, it is of some practical importance to note that the maintenance-of-equipment expenses of any railway may be affected by the prevailing practice of hiring equipment. On cars of some "foreign" road which are used by a railway, rental is paid which is probably enough to cover ordinary repairs, as well as interest and depreciation. Nevertheless, the actual expenditure for ordinary repairs is made by the owner of the car and the rent paid by the user cannot be credited to the car repairs account. It follows that the road using much foreign equipment ordinarily has a relatively lower car repair expense item than one which more nearly supplies all its own equipment. This point should be considered in any comparison of the maintenance-of-equipment expenses of various roads.

Other Classes of Expense.—Average maintenance expense constitutes over 40% of the total operating expenses, and average transportation expense over 50%, as reported in the Interstate Commerce Commission's *Statistics of Railways in the United States.* Traffic expenses on the average only amount to about 2.5% of the total. It must be remembered, however, that there is no clear line of demarcation between these various groups. For example, when materials for maintaining its road or for repairing its equipment are hauled by a given carrier, a large part of the expense of the haul is not distributed between maintenance and transportation, and is mostly charged to "transportation–rail line." Similarly, the expense of hauling fuel for developing power in a shop used to repair equipment does not appear to be charged against the shop. Of course, the general expenses (about 3.5% of the total) are incurred for the operation of the railway, and since they are not distributed, the true totals for the three departments, maintenance, transportation, and traffic, are not completely worked out.

Gross Operating Revenue.—We come next to the operating revenue account, which embraces all earnings from the movement of freight and passengers, and from transportation service related to such movement. It includes not only actual current receipts but also accruals, that is, items due but not received during the period covered by the account. Concerning operating revenue in general, we will merely state that "absorbed expenses,"[1] such as bridge and ferry arbitraries and switching and terminal service charges, are deducted directly from revenue. When an originating carrier quotes a rate which covers delivery by some connecting carrier, it "absorbs" the charge of that connecting carrier and deducts it from its gross revenue.

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[1] See below, page 488.

Over 97% of the revenues of the average American railway come from "transportation–rail line," and over 90% come from the transportation of freight and passengers. Other items, roughly in the order of their importance, are express, mail, switching, milk, excess baggage, sleeping-cars, etc. "Transportation–water line" on the average brings in less than 1% of the total operating revenues of railways. This item only includes boat lines which might be operated separately; that is, it does not include ferries, car floats, etc., necessarily operated in connection with track terminals.

"Incidental" operating revenue which comes from the operation of dining-room, storage facilities, stockyards, etc., and from demurrage charges collected, is only about 2.5% of the total operating revenue. Under this head there is included an item called "rents of buildings and other property," which illustrates the difficulty of classifying railway operations. Really this item represents "income" rather than earnings from operation, but it is practically impossible to distinguish the payment for such service charges as heat, light, and power from the pure rent item.

Net Operating Income.—When operating expenses are deducted from operating revenues, the net operating revenue which remains is the main part of the "income account." The railway's income account is a statement of debits and credits arising from all its business transactions during a given period, including both operating and non-operating accounts. The income account is, therefore, not confined to operation, for its purpose is to show the net income from all sources.

In the first place, from the net operating revenue there is deducted an item called "tax accruals." This item is not treated as a part of fixed charges along with interest and rent, but is more closely associated with operation. On the other hand, neither the owners nor the operators are responsible for their tax bill and consequently it is shown as a separate item. The balance, after deducting tax accruals from net operating revenue, is called "railway operating income."

Non-Operating Income.—To the total operating income we must add the non-operating income to arrive at "gross income" from all sources. The non-operating income consists chiefly of rentals, dividends received, and payment for the use of equipment. The item of "dividend income" and also "income from funded securities" are among the most important ones under the heading of non-operating income. Many railways are holding companies having as important and perhaps their main assets the securities of other companies. Their relations with their subsidiaries may be vital, and in some cases the net income of the group must be considered to get a true picture of the situation. It may be that dividend income is a large part of the total income as in the case of the Union Pacific, which in one year had a dividend income amounting to over $11,000,000, against net operating revenue of $31,000,000.

One point to consider in examining a railway company is whether income from dividends or funded securities is being credited without being actually earned. For example, it appears that the Denver and Rio Grande has owned a large amount of the second mortgage bonds of the Western Pacific and that it once credited a large item of accrued interest on its bonds as income. The interest on the bonds, however, was not actually paid and had to be carried as a "deferred asset." This is a dangerous practice and may result in financial embarrassment if the income is not paid.

Income from separately operated properties is another item of non-operating income and requires watching, largely because there seems to be no sufficiently clear provision for handling deficits of separately operated subsidiaries. An important subsidiary of the Illinois Central is the Yazoo and Mississippi Valley, which subsidiary sometimes shows a deficit. The controlling company, however, unless there is some definite arrangement, is not required to carry such a deficit to its books and apparently may show it under the heading of "miscellaneous income charges." Sometimes, there is an agreement or contract between two companies, providing that one shall be responsible for the deficits of the other. In this case, the amount of the deficit is treated as a "deduction from gross income" and is entered by the responsible company under the head of "separately operated companies—loss." The item should then be carried by the company which receives the guaranty as "contributions from other companies" which is an item of non-operating income.

Finally, from gross income certain "deductions" are made to cover rents and interest *paid* and losses. These are purely financial matters, not connected in any direct way with the operation of the railway proper. It is to be noted especially that rents paid, like interest paid on bonds, are not treated as operating items but as items pertaining to *property* which does not bear the risks of operation.

Before transferring the balance of the income account to profit and loss, part of the net income must be disposed of in various ways, such as payment of dividends, or application to sinking funds or other reserve funds. Such dispositions are those normally required to maintain the credit of a company and keep its property intact.

Profit and Loss Account.—This brings us to the profit and loss account, which is a statement of debits and credits designed to show the surplus or deficit of the company as affected not only by the income of a given period but also by accounting adjustments not attributable to the period. Moreover, the profit and loss account embraces any dispositions of net profits which are optional and a matter of policy, and miscellaneous gains and losses not provided for elsewhere.

Probably the items which most require discussion are the various appropriations of surplus provided for in the profit and loss account. In the first place, we note that a railway may pay dividends or extinguish discount on its securities sold, either by charging net income or by charging profit and loss. Dividends, for example, might exhaust net income available and so make it necessary to draw on the surplus shown in the profit and loss account. This is in accordance with the distinction made under the Interstate Commerce Commission's system of accounting between appropriated surplus (i.e., amounts set aside and invested in physical property) and profit and loss balance.

It has long been the practice in American railway finance to put back a part of current net income into the property without directly capitalizing such sums by issuing stocks or bonds. In England, where conditions are more stable, it has been customary immediately to capitalize investments in physical property; but in America, where there are greater fluctuations in the railway business, it has been the custom to appropriate surplus for making additions to railway property without increasing the capital liabilities. This is, in a sense, the most conservative policy. It creates a surplus in the property which may be drawn upon in lean periods. Thus, the Chicago, Burlington and Quincy in 1920 asked permission from the Interstate Commerce Commission to issue $60,000,000 in additional common stock as a transfer of surplus to capital account. Also, it asked to issue a large amount of bonds to reimburse its treasury for funds that had been expended in additions and betterments. In short, the company then proposed to transfer from appropriated surplus to profit and loss balance and thus to its balance sheet, large sums which it had put back into its property without capitalizing them.

Clearly, it is highly important to the investor and to the student of railway finance closely to scan "appropriated surplus" for the purpose of finding out the policy pursued by any railway and learning if any surplus has been accumulated in the property concerned. Also, in the past, losses have been concealed, since the expense of acquiring new lines and of reorganizing has been charged to this account—sometimes under the head of "discount on securities." Thus some years ago, the Atchison, Topeka and Santa Fe carried in its balance sheet an item of over $95,000,000 as "cost of road and appurtenances" but of this amount over 40% covered discount on bonds, reorganization expenses, etc.

Balance Sheet—Investment in Road and Equipment.—This brings us to the balance sheet and to the account known as "investment in road and equipment." A railway balance sheet has the form usual in progressive corporation accounting. The chief problems arise from the very large proportion of fixed capital involved in investments in railways and the complicated intercorporate relations among controlling companies and subsidiaries. These problems are made more acute by the fact that railways are public utilities which have to operate continuously in order that society may exist.

By far the most important single item among the assets of the balance sheet is investment in road and equipment—about 65% of the total assets—and here the problem is to have reflected in the accounts the true amount of capital invested in the physical plant. No intangible items, such as cost of development, are included. Formerly, the true investment account was not maintained, and it was frequently the case either that profits were concealed by inflating the current operating expenses through not charging property additions and betterments to capital account, or by a false showing of net revenue through capitalizing expenditures that should have been charged to current operation. By accurate definition and classification of accounts the Commission has greatly decreased manipulation and done much to safeguard both the credit of the railways and the interests of investors. At the same time the efficiency of railway operations has been increased.

Additions and Betterments.—Probably the most important step in this direction came in the handling of "additions and betterments." In the first place, the original construction account has been sharply distinguished from additions and betterments. The original construction account covers the purchase of right-of-way, the construction of road bed, track, etc., the purchase of locomotives, cars, floating equipment, etc., and general expenditures prior to the transfer of the new road to open line work. These general expenditures include organization, general office, and legal expenses, taxes, and interest during the period of construction. All the items must be on a cash basis, and where stock and other considerations are given for property, they are to be valued on a current cash basis.

Additions and betterments, on the other hand, include new construction and extensions after the road begins operation. Additions properly represent the cost of adding to the quantity of existing railway facilities—more tracks, more ties, more cars. Betterments represent the cost of improvements in existing facilities, as by substituting heavier rails and steel tired wheels for cast iron. By "extensions" is meant the cost of constructing or purchasing property used to enlarge the territory served by a railway.

Renewals.—Having thus distinguished new construction from the original cost, it remains to work out more completely the difference between those expenses which are merely renewals and which are therefore chargeable to operation and those which are properly additions or betterments and therefore chargeable to capital. As already observed, this is particularly difficult where there is such an enormous and complex mass of fixed capital as there is in the railway investment account.

When materials are currently consumed, as for example, fuel and oil, they are properly charged to expense; but when not currently consumed, the question arises, Is the cost incurred merely to renew an item already in the capital account, or does it add to or better such an item? The Interstate Commerce Commission rule provides for charging to cost all expenditures for replacing items with others of the same kind as those already in use, even if they have to be bought at an increased price. Such expenditures represent renewals. If, however, items of an improved kind are purchased, the rule is that "the cost chargeable to the accounts of this classification is the excess cost of new parts over the cost at current prices of new parts of the kind retired." That is, the difference between the cost of the old kind and the new kind is charged to capital account, and part of the expenditure is therefore renewal cost and part additions and betterments.

Occasion for Additions and Betterments.—Two questions which come up at this point for consideration by the economist concern the occasion for making additions and betterments. Let us suppose that some monumental station or luxurious passenger coaches or expensive safety devices, none of which increase net earnings, are installed by a railway company, and that the installation is made in response to the compulsion of legislation or of public opinion. Here the investment is in excess of economic requirements and is compulsory. In such cases there is a strong argument for charging the additions and betterments, in part at least, as operating expenses, thus making the public pay currently for the satisfaction of their extraordinary demands. Another case concerns expenditures which merely serve to bring a backward railway up to the general competitive level. Such expenditures might be made by some weak line which had not been able to keep its track and equipment up to those of its competitors. It is argued that in this case the expense should be charged to revenue, on the ground that the improvements made are not additions and betterments in a general sense but are the cost of making current operation effective. The best opinion seems to be that such expenses are really delayed construction or purchase of equipment. Clearly, expenditures which increase the competitive efficiency of a line are additions and betterments and represent increased capital.

Retired or Abandoned Property.—Closely connected with the foregoing subject is the handling of property retired or abandoned in cases which may be called reconstruction. If any such property, say a building or a locomotive, is retired or abandoned without being replaced, it is charged against surplus. It does not represent any future maintenance expense and must therefore be written off the capital account. If, however, the property is replaced, as when 30-ton freight cars are substituted for 15-ton cars before the latter are worn out, the abandoned property is charged to operating expense and credited to the appropriate account under investment. Provision is made to lighten the load when an extraordinarily large item, which would unduly burden operating expenses, arises.

Investments in Affiliated Companies.—In introducing the subject of the balance sheet (page 85) it was stated that one of the difficulties in the case of railways is the prevalence of complicated intercorporate relationships. Investments in the stocks and bonds of affiliated companies is an important item

(16.5% of the total assets) and is an item which often requires scrutiny. The investor in railway securities needs to inquire into the revenue-producing power of the properties concerned and into the value of traffic interchanged with subsidiaries and controlled lines. The book value of the investments may not be justified by the answers to these inquiries.

Another point to consider is the nature of interest and dividends receivable under the heading of current assets. Under Interstate Commerce Commission rules, a carrier may count as an asset dividends and interest *accrued,* even before declared or paid. This item, however, should not include any sums the payment of which is not reasonably certain, but in practice it may represent interest payments or dividends on securities of subsidiaries which are hoped for but not seen. When this is the case the item really belongs under the head of "other deferred assets," under which are properly included more doubtful items. Again, this item should not include interest or dividends on securities of any companies whose rates are guaranteed. It is an old trick of corporation finance, too often practiced by railway companies in the past, to advance funds to an affiliated company whose bonds are guaranteed or whose stock is controlled, and then draw back the advances as dividend income under the heading of non-operating income. Accordingly, suspicions are justified when there is large increase in "advances" at the same time that "non-operating income" increases.

Doubtless it is to be remembered that control is often acquired over roads for the traffic and competitive advantages rather than for the income to be secured from the controlled properties, but ordinarily "investments in affiliated companies" should bear some reasonable relation to income from dividends and funded securities.

Part II—Railway Geography

CHAPTER VI

RAILWAY GROUPS—NEW ENGLAND ROADS

Railway Geography Important.—The phase of transportation which is next to occupy our attention might be called railway geography. The next few chapters deal with several of the important railway regions into which the country is divided, discussing the traffic and operating conditions which characterize those regions.

Too little attention is paid to the railway as a factor in geography. The traditional emphasis of political boundaries, capitals, and the like, still prevails. A moment's thought, however, will convince any progressive mind that the railway occupies a prominent, if not the first, place in geography. Cities nowadays develop and grow according to their railway connections—are even located with reference thereto. The commerce and travel by river and highway are negligible in comparison with transportation by railway. More than that, the boundaries of traffic territories are in many respects more important than the boundaries of states; nor do the boundaries of such territories always coincide with state lines. Indeed, the greater part of our commerce—well over 75%—is "interstate," and the railway has been a potent factor in the process which is often referred to as breaking down state lines. At the same time, the railways have established new lines which bound certain territories within which the traffic problems are more or less similar.

It is of high practical importance, therefore, from every point of view, that there be a good understanding of the railway situation in the different parts of the country. As already indicated, from a mere geographical point of view, the subject is vital, and it may be predicted that the time will come when school children will hear more of the Pennsylvania system or the Union Pacific and less of the Mississippi River and the boundaries of Nevada. From the point of view of the shipper, the subject has practical value as furnishing the basis for an understanding of traffic and rate problems. The student of public affairs and of the relations between the carriers and the government must be versed in the peculiar railway operating and traffic conditions in different parts of the country, for those differences are so great as to make uniform treatment impossible.

Railway Groups—Geographical Divisions.—Railways may be grouped according to their geographical location and according to their traffic and operating characteristics. They may also be grouped according to ownership.

Geographically, the railways of the United States are often divided into three great groups—the Eastern, Southern, and Western—and this grouping is used by the Interstate Commerce Commission in presenting statistics. It also corresponds to the classification territories which are used by the railways in making rates. As the names indicate, the Eastern District includes all those lines east of the Mississippi and north of the Ohio; the Southern District includes all roads east of the Mississippi and south of the Ohio; the Western District includes all roads west of the Mississippi.

The three main districts are in turn subdivided by the Interstate Commerce Commission as shown in the following outline, in which a few typical carriers are mentioned to indicate more vividly what each subdivision covers.

Eastern District:	
New England region	New York, New Haven, and Hartford; Boston and Maine.
Great Lakes region	New York Central; Erie; Delaware, Lackawanna and Western.
Ohio–Indiana–Allegheny region	Pennsylvania; Baltimore and Ohio; Central of New Jersey.
Southern District:	
Southern District (excluding Pocahontas region)	Atlantic Coast Line; Louisville and Nashville; Illinois Central.
Pocahontas region	Chesapeake and Ohio; Norfolk and Western.
Western District:	
Northwestern region	Chicago and Northwestern; Great Northern; Northern Pacific.
Central western region	Atchison, Topeka, and Santa Fe; Union Pacific; Rock Island.
Southwestern region	Missouri, Kansas and Texas; Southern Pacific; Missouri Pacific.

The foregoing classification is self-explanatory except that it should be noted that the Pocahontas group which occupies the northern part of the Southern Territory is chiefly distinguished by the soft coal traffic which predominates within it and from which it gets its name.

Groups Based on Traffic and Operation.—From the point of view of traffic and operation, the railways of the United States are ordinarily grouped into territories which conform to some extent to the geographical grouping. The various classification and rate-making territories will be mentioned in the chapter dealing with classification and rates. Here we are concerned with the groups of railways which are distinguished chiefly by such territorial differences as affect traffic and operation. From this point of view we find the following groups:

1. The New England Roads (occupying the New England states).
2. The Trunk Lines (extending from New York, Philadelphia, and Baltimore to Chicago and St. Louis).
3. The Anthracite Roads (extending from the anthracite coal fields of northeastern Pennsylvania to tidewater).
4. The Pocahontas Roads, or "soft coalers" (extending east and west from the soft coal fields of West Virginia).
5. The Granger Lines (mostly radiating west and northwest from Chicago).
6. The Southern Roads (occupying the southeastern section of the country).
7. The Southwestern Roads (running southwest from Chicago and St. Louis).
8. The Transcontinental Roads (extending from various central western points to the Pacific Coast).

These different groups will be discussed in the chapters which immediately follow. Here it is sufficient to state that each has its traffic peculiarities which cause differences in operation and in earnings, and that these differences often find expression in the way the prices of the securities of the carriers move. Within each one of the groups mentioned there might be established certain subgroups, but underlying similarities still justify the larger groups.

Groups Based on Ownership.—From the point of view of ownership, railway groups are continually shifting. Such groups as the "Hill roads," the "Harriman roads," and the "Morgan roads" have been prominent in the past, but with the death of the individuals whose activity dominated the organization these groups have been largely broken up, although traces still remain. Other groups have succeeded them, one of the latest being the Van Sweringen group which includes certain roads in Trunk Line territory. The movement now on foot to encourage railway consolidation is likely to bring further change in ownership.

Each of these groupings has its importance, but for the purpose immediately in hand we will follow the grouping determined by traffic and operating characteristics.

THE NEW ENGLAND RAILWAYS

Principal New England Lines and Gateways.—The principal railways of New England are the following: the New York, New Haven and Hartford, the Boston and Maine, the Central Vermont, the Bangor and Aroostook, and the Maine

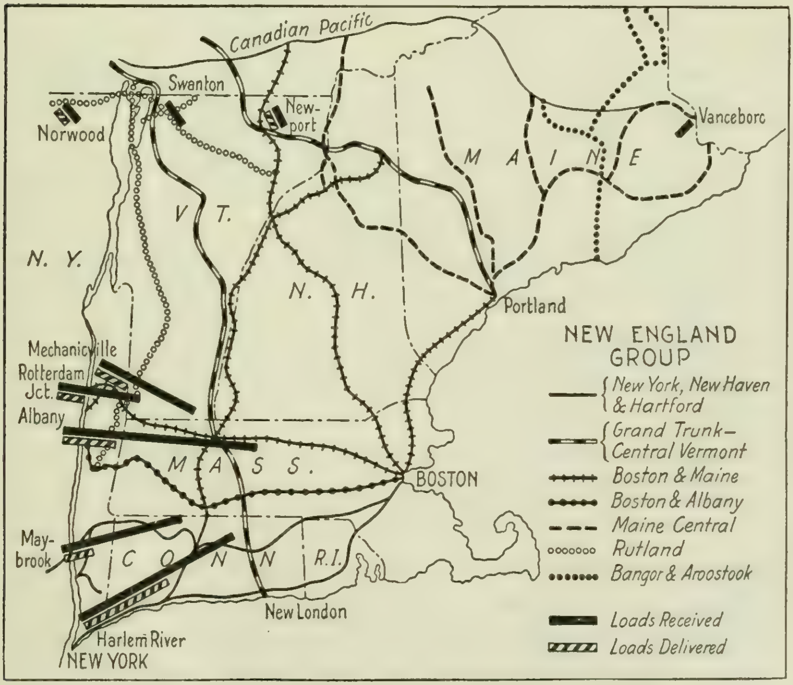

Fig. 10.—Map of New England Roads, also Showing Principal Gateways
(Relative importance of gateways indicated by length of bars, which represent the number of loaded freight-cars that came into and went out of New England in 1919)

Central (Figs. 10, 11). The Boston and Albany also lies in New England, but is controlled by one of the Trunk Lines, the New York Central. Two Canadian carriers, the Grand Trunk and the Canadian Pacific, also reach down into New England, the former being affiliated with the Vermont Central.

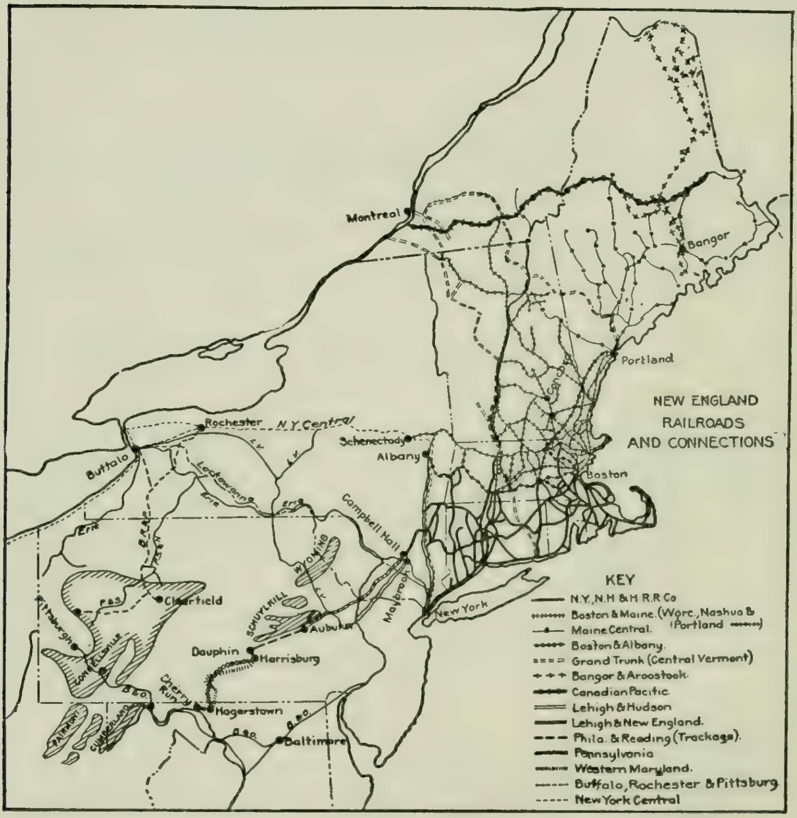

Fig. 11.—Map of New England Railways and Connections, and also Contributory Coal Fields

The Boston and Albany, which extends across Massachusetts from the neighborhood of Albany, divides the New England carriers into two groups, the New Haven covering the southern half, the others lying to the north. The New England roads, for the most part, spread out from Boston like a fan, extending up into Maine, to Montreal, to Albany, and to New York.

At the extremities of this fan-like net lie a series of gateways where the New England lines connect with outside carriers. The chief ones are:

Harlem River (N. Y.): The New Haven connects with the Pennsylvania; Lehigh Valley; Baltimore and Ohio; Lackawanna; and other lines.

Maybrook and Campbell Hall (N. Y.): The New Haven connects with the Erie; and the Lehigh Valley; New York, Ontario and Western; and other anthracite roads via the Poughkeepsie Bridge over the Hudson and two short roads,—the Lehigh and Hudson and the Lehigh and New England.

West Albany (N. Y.): The Boston and Albany connects with the New York Central.

Rotterdam Junction (N. Y.): The Boston and Maine connects with the New York Central.

Mechanicville (N. Y.): The Boston and Maine connects with the Delaware and Hudson.

Newport (Vt.): The Boston and Maine connects with Canadian Pacific.

Swanton (Vt.) and St. Johns (Quebec): The Central Vermont and the Boston and Maine connect with the Grand Trunk.

Supply of Railway Facilities.—There are only a little over 8,300 miles of railway line in New England, which together are but a little over 3% of the total mileage of the country. New England, however, has a railway mileage in proportion to the area served which is considerably above the average of the country, running as high as 27 miles of railway per hundred square miles in Massachusetts as against an average of about 8½ miles for the United States. On the other hand, so dense is the population of New England that the number of miles of railway in proportion to number of persons served is considerably below the average for the country.

As to equipment, the New England railways are not strong in freight-cars or freight locomotives, but they have a larger number of passenger-cars and passenger locomotives per mile of line than any other group of roads in the United States.

Physical and Economic Conditions Affecting Railways.—New England's physiography and location with reference to other sections are important as affecting her railways. In the first place, it is to be noted that New England is out of the central current of traffic, and Boston is more distant from the heart of the Mississippi Valley and from the Pittsburgh production center than are New York, Philadelphia, and Baltimore. From Chicago it is 850 miles to Boston and 890 miles to Portland, Me., while the straight line distance to New York is only 710 miles and to Baltimore 610 miles.

To New England's disadvantage of location for traffic is to be added the barrier imposed by the Berkshires and the Hudson River. This is not now so important as it once was, but it has had a part in causing the situation that now exists and still has some importance. Boston was long hindered in her development by having only one single-track line to the west, the Boston and Albany, and the westward extension of the Boston and Maine required the construction of the Hoosac tunnel.

Another important point is the absence of coal in New England and the distance which fuel has to be hauled from Pennsylvania and other coal-producing territory (see Fig. 11).

One advantage of location which New England possesses is her proximity to the most highly developed part of Canada. This makes a relatively short haul for coal and lumber from that source. It also gives her ports some of Canada's export grain traffic and the Grank Trunk has greatly aided New England in this way. The Canadian Pacific takes grain from Duluth to Montreal or to Portland or Boston, and it is possible that the shifting of the spring wheat area northward may further help Boston and the New England roads by increasing this movement.

On the whole, however, it must be recognized that the New England roads are in a sense isolated. They do not serve directly any important producing territory outside of New England and they depend largely on tonnage exchanged with their rail and water connections. As has been often noted, they are virtually terminal carriers for the Trunk Lines of the United States and Canada.

Inbound Traffic by Various Gateways.—In spite of her advantage for Canadian traffic, the volume received or sent out via northern gateways is relatively small. In 1919 a total of approximately 1,245,000 cars were received by all gateways. Of this total only 91,700, or 7.4%, moved in over the Canadian Pacific and Grand Trunk. The chief importance of the Canadian connections thus far has been to relieve congestion and serve as a competitive factor in rate divisions with the Trunk Lines.

The chief single gateway is Albany, but the New Haven receives a larger volume of traffic over its two gateways, Harlem River and Maybrook.

Boston as a Railway Center.—Boston is truly the hub of New England and also of the New England railways. It is, therefore, essential to consider the position of that port as a railway center.

In spite of her excellent harbor and port facilities, Boston has, on the whole, been losing in competition for the valuable export railway traffic. For freight to and from the Central West and the Great Lakes territory, New York has a great advantage, arising from its position at the terminus of the great natural Hudson and Mohawk Valley route. For traffic from the West the two points may be considered equal as far as Albany; but from there on the rail distance to New York is only between 160 and 170 miles, while the distance to Boston is from 214 to 227 miles. Moreover, the ruling grade between Boston and Albany is greater, and there is a greater total ascent than between New York and Albany. Consequently, Boston's chief opportunity arises from her greater nearness to Liverpool and to such advantages in port facilities as she has. Sometimes, too, there is overflow freight which is diverted to the New England roads in order to avoid congestion on the lines serving New York.

In the case of traffic from the South and Southeast it is apparent that there is little if any object in hauling beyond New York and into New England for export.

For Canadian railway traffic, as already noted, Boston has an advantage. Montreal and Quebec are river ports and closed by ice a part of each year, while to Halifax and St. Johns the railway haul is longer than to Boston and the grade steeper. It is true that the railway haul from Montreal to New York is nearly as advantageous as that to Boston, but the rail distance to Boston is 50 miles less and the ocean distance from Boston to Liverpool is 180 miles shorter, so that here, too, the New England port has some advantage for Canadian traffic.

Economic Conditions within New England as affecting Railways.—Manufacturing is the chief New England industry and manufactured products furnish an unusually large part of New England railway traffic. For the United States as a whole, the proportion of manufactured products in the total tonnage has been about 17%, while in the case of the New Haven and the Boston and Maine it has been over 20%. This means a large proportion of high-grade traffic, that is, traffic which has high specific value and yields high average receipts per ton-mile. The chief products are boots and shoes, cotton goods, woolens and worsteds, paper, leather articles, rubber goods, hardware, and miscellaneous manufactures, much of which require skilled labor and fine technique. These are the things which New England railways haul out.

In order to produce these things, the New England manufacturer requires raw materials, fuel, and food products, a large part of which must be hauled in from other sections. This means a long haul from southern and western points to Boston and other distributing centers—but chiefly to Boston—from which points short hauls are made to the mills and factories which are scattered throughout a great part of New England. In 1920 over 22,000,000 tons of bituminous coal were shipped into New England by rail or water, and a little less than half that much anthracite. Over 50% of the bituminous coal was hauled all-rail. Cotton and iron and steel are also important inbound items. For every three carloads of manufactured products sent out of New England it is estimated that approximately five carloads of raw materials must be hauled into that territory. Consequently, the larger part of the tonnage, although the least valuable part, consists of the inbound raw materials.

Along with New England's manufactures go a dense population and numerous cities. The population of Massachusetts averages over 479 to the square mile as against approximately 36 for the United States; and the urban population in Massachusetts is 95% of the total against an average of only 51% for the whole country.

Another factor affecting New England traffic is the great tourist and summer resort travel which is characteristic of that section. Her mountains and seacoast attract thousands of persons, and this makes the July, August, and September passenger traffic of such roads as the Boston and Maine very great. This is a vital element in the business of the New England railways.

Traffic Characteristics—Dense Passenger Traffic.—Perhaps the most notable characteristic of New England railway traffic is the importance of the passenger branch. The density of passenger traffic, as expressed in the number of passenger-miles per mile of line, is as great as or greater than in any other section, and the New Haven has the densest passenger traffic of any large railway in the United States. In 1919 it hauled 1,029,000 revenue passengers per mile of line, while the Pennsylvania railway hauled only 758,000.

There is only one other section that has so many passenger train-miles per mile of road as has New England and that is the Great Lakes region, which in 1920 had a slightly greater passenger-mile "density" than New England. The number of passenger-cars in the average New England train, however, is greater than in any other section, including the Great Lakes region.

More than this, the New England roads show the highest average number of passengers per car, the figure being approximately 25 as compared with an average for the United States of 18 in 1920 and 15 in 1921.

The railways of New England also show an especially large proportion of commutation traffic, and returns for December, 1921, bring this out clearly. In that month the commutation passengers carried by New England roads were approximately 63% of the total revenue passengers, while for the carriers in the Great Lakes region the commutation passengers made only 52% of the total. No other sections had such high percentages.

High Grade, Short-Haul Traffic.—The second outstanding characteristic of New England traffic is the large percentage of high grade freight as reflected in the average revenue per ton-mile. This revenue is higher than in any other section and in 1921 was 1.85 cents as against an average for the United

States of 1.27 cents. The absolute amounts of these figures will vary as freight rates are raised or lowered, but the excess of the New England figure will continue.

The average haul in New England is short. There the average distance a ton of revenue freight is hauled is about 103 miles. The average haul for the United States is in the neighborhood of 186 miles, and in no other region is there so short an average haul as that found in New England. The passenger traffic, too, is mostly of the short-haul variety, the average trip being about 21 miles, as compared with the United States average of about 37 miles.

Operation Expensive.—Concerning the operating statistics of the New England railways we will only point out that these roads have an unusually small freight-train load, small carload, and a low average number of miles made by each car per day. The traffic density is also somewhat below the average for the United States.

A marked characteristic of New England traffic is the smallness of the average freight-train load. It is the smallest of any section. The average freight-train load (net tons) in 1920 and 1921 was respectively 465 tons and 448 tons compared with over 600 tons on the average in the United States. The smallness of the trainload is partly due to the relatively small number of cars per train and partly to the small number of tons per car.

The operation of a railway in New England is considerably more expensive than that of the carriers in most other sections. To begin with, the cost of construction and maintenance is considerably greater than that of roads in the middle western part of the country. The average investment per mile of road is somewhat over $100,000,—almost 60% greater than the western average. The hilly surface of New England, its rocky soil, and severe climate, all contribute to the heavy cost;

and the situation is made more difficult from an operating point of view by the density of population which results in many grade separations, crossings, and junctions.

Furthermore, the expense of operation is increased by the character of the traffic and New England's peculiar relation to other sections of the country. As already noted, the New England carriers are, to a large extent, terminal facilities for the Trunk Lines. They are short lines and have short hauls. Accordingly, the terminal expenses are proportionately large. The numerous crossings and junction points required go hand in hand with a heavy percentage of switching and transfer expense. The New England roads necessarily hold an unusually large proportion of "foreign cars"—belonging to other carriers—for which they have to pay per diem charges. Their debits on this account are much heavier than the credits and this is a drain on their resources.

It is for such reasons as these that the Interstate Commerce Commission in 1922 increased the percentage of through rates which goes to New England lines, giving them a larger share of the revenue from freight in the hauling of which they participate in connection with outside roads.

The rate structure that exists in New England will be discussed in Chapter XXI.

Commodity Statistics.—The principal commodities handled by the New England roads are shown in the following statement:[1]

(Year ending December 31, 1922)

COMMODITY	Tons Handled	Per cent of Total
Anthracite and bituminous coal	18,078,372	22.93
Miscellaneous manufactures	10,954,564	13.89
Less than carload freight	6,617,047	8.39

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[1] Report of Joint New England R. R. Commission, 1923.

COMMODITY	Tons Handled	Per cent of Total
Grain, flour and other mill products, hay, straw, and alfalfa	6,574,616	8.34
Lumber and other products of forests	6,453,743	8.18
Cement, brick, lime, and plaster	3,868,165	4.91
Refined petroleum and its products	3,273,742	4.15
Clay, gravel, sand, stone, and other products of mines, except coal and coke	3,268,365	4.15
Potatoes	2,596,603	3.29
Paper, printed matter, and books	2,491,740	3.16
Pulp wood	1,885,642	2.39
Bar and sheet iron, structural iron, iron pipe, other metals, pig, bar, and sheet	1,751,374	2.22
Fruit and vegetables and other products of agriculture	1,387,058	1.76
Fresh meats, other packing-house products, canned goods	1,277,543	1.62
Ice	1,241,770	1.58
Iron, pig and bloom, castings, machinery and boilers	1,168,434	1.49
Chemicals and explosives	830,205	1.05
Unclassified tonnage	825,507	1.05
Cotton	669,995	.85
Other products of animals	524,304	.66
Sugar, syrup, glucose, and molasses	514,896	.65
Coke	500,927	.64
Textiles	465,300	.59
Hides and leather	416,113	.53
Automobiles and auto trucks	394,748	.50
Livestock	389,842	.50
Wool	302,935	.38
Rails and fastenings	122,080	.15
Total	78,845,630	100.00

CHAPTER VII

THE TRUNK LINES

Nature and Importance of the Trunk Lines.—The Trunk Lines (see Fig. 12) are so called because of their importance as main stems in the railway net of the country. While the relative importance of these roads may not now be so great as it was a generation ago, they still occupy a specially significant place in the nation's transportation system. When one thinks of their location this is easy to understand. Considered as a group, they may be thought of as the connecting link between the nation's chief seaports and the great Mississippi Valley with its grain, cattle, growing manufactures, and multiplying population. Over these lines, too, must move a large part of the products of the densest manufacturing territory in the nation, while the manufacturing population must be fed.

More precisely, the Trunk Lines serve to connect Boston, New York, Philadelphia, Baltimore, Newport News, and Norfolk with the two great centers of the Mississippi Valley territory, Chicago and St. Louis.

The Chief Trunk Lines.—The chief Trunk Lines and their characteristic subsidiaries are the following:

1. New York Central Railroad (New York to Chicago and St. Louis, via Buffalo):
    - Boston and Albany Railroad.
    - West Shore Railroad.
    - Cleveland, Cincinnati, Chicago, and St. Louis Railway.
    - Michigan Central Railroad.
    - Pittsburg and Lake Erie Railroad.
    - Toledo and Ohio Central Railway.

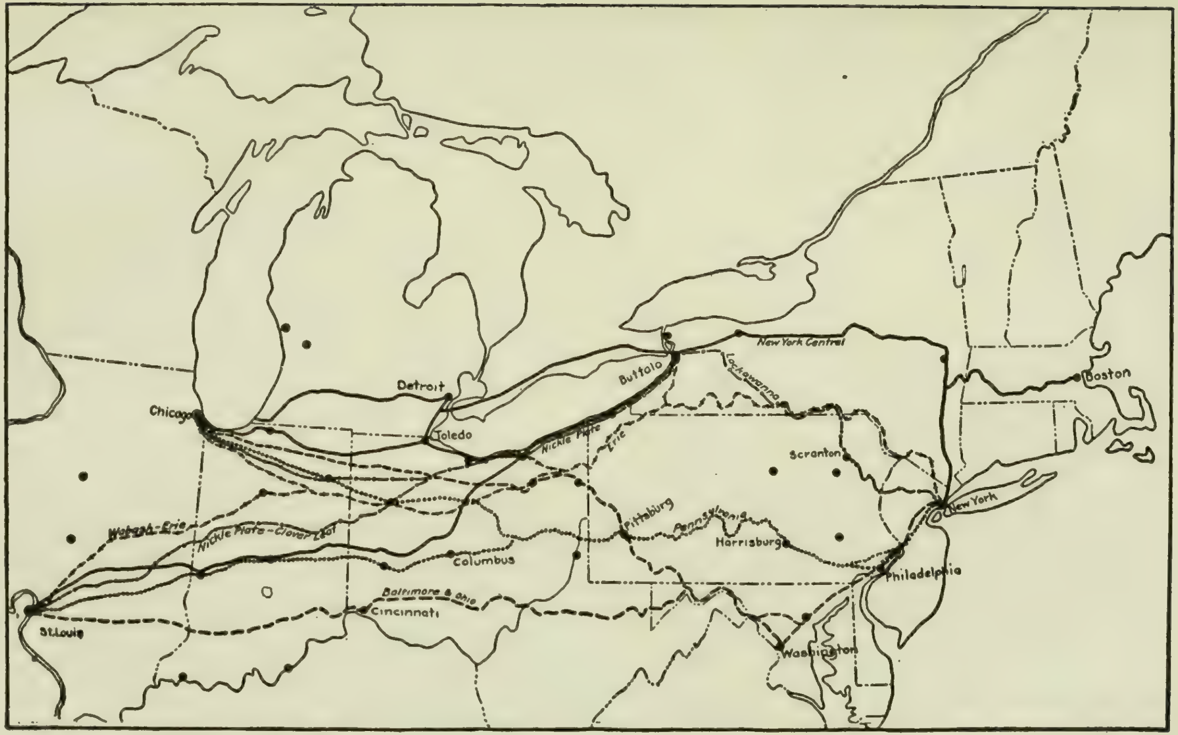

Fig. 12.—Map of the Trunk Lines (together with chief available stems)

2. Pennsylvania Railroad (New York and Philadelphia to Chicago and St. Louis via Pittsburgh):
   - Long Island Railroad.
   - Pittsburg, Cincinnati, Chicago and St. Louis Railroad.
   - Philadelphia, Baltimore and Washington Railroad.
   - Grand Rapids and Indiana Railway.
3. Baltimore and Ohio Railroad (Baltimore and Philadelphia to Chicago and St. Louis, via Pittsburgh and Cincinnati—has trackage rights into New York):
   - Baltimore and Ohio Southwestern Railroad.
   - Pittsburg and Western Railroad.
   - Toledo and Cincinnati Railroad.
4. Erie Railroad (New York to Chicago, via Salamanca, N. Y., with branch to Buffalo):
   - Chicago and Erie Railroad.
   - New York, Susquehanna and Western Railroad.
   - Cleveland and Mahoning Railway.

Each of these four lines extends from the coast to Chicago and other middle western points.

In addition, there may be mentioned as closely related to the Trunk Lines proper and as competitive therewith, the following roads: Grand Trunk, Chesapeake and Ohio Railway, and Norfolk and Western Railway. The first of these is a Canadian carrier which furnishes a route via Montreal from the Atlantic seaboard to Chicago. The other two are best classified as Pocahontas roads and will be discussed in another chapter. They extend from the Virginia ports through the West Virginia coal fields to the West. The Chesapeake and Ohio only got a Chicago connection in 1910. It now is affiliated with the New York, Chicago and St. Louis ("Nickel Plate"), thus gaining more significance as a Trunk Line.

There are other east and west lines within the general territory of the Trunk Lines which have some of the characteristics of the Trunk Lines proper, and which may, by combination and growth, develop further. Among these we will only mention the New York, Chicago and St. Louis (Nickel

Plate) which extends from Buffalo to Chicago and reaches St. Louis via the Toledo, St. Louis and Western; the Delaware, Lackawanna and Western, which operates through trains from New York to Chicago, although not owning line beyond Buffalo; and the Wabash, which operates from Buffalo to Chicago and St. Louis.

The Trunk Lines proper all pass either through Buffalo on the north or Pittsburgh on the south. At the west, they all have termini in Chicago and three of them also reach St. Louis. At intermediate points they connect with a radiating net work of smaller lines which serve as feeders.

Supply of Railway Facilities.—While this chapter will deal chiefly with the four typical Trunk Lines, it will help toward an understanding of the situation in the territory served by them to present some data which apply to that whole district. This district is embraced within the two areas called by the Interstate Commerce Commission the Great Lakes region and the Ohio-Indiana-Allegheny region. The two regions together have a mileage of "Class One" roads[1] of a little over 50,000 miles—about six times as great as that of New England. In the eastern part of the territory the number of miles of line per 100 square miles of area is similar to that in New England, while in the western part the density is somewhat lower, being only about 21 miles of road to 100 square miles. Throughout the territory the railway density is far greater than the average for the United States.

Compared with population the number of miles of line throughout most of this territory is much less than the average for the United States, but is greater than that in the more important New England states.

The Trunk Line district has the largest number of freight locomotives and cars in proportion to railway mileage of any section, and is second only to New England in its equipment of passenger locomotives and cars and in proportion to miles of line.

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[1] Roads having an annual gross operating revenue of over $1,000,000.

Physical and Economic Characteristics Affecting Railways —Topography.—It cannot be too much stressed that the Trunk Lines are the chief channels for commerce between what are still the chief cities of the Mississippi Valley and the chief Atlantic ports. They connect the great agricultural West with the markets of Europe. Through them, as through a great funnel, pour the products of the West for export or consumption in eastern cities.

The routes and operating characteristics of the several Trunk Lines are influenced by the topography of the country. The salient point is the great barrier of the Allegheny Mountains which stretches across this district from the northeast to the southwest. Through this barrier there are only two natural routes leading out of the Mississippi Valley, one being furnished by the Great Lakes and St. Lawrence River, the other by the Mohawk and Hudson rivers. Perhaps the next best way, though it is much less advantageous as to grades and curves, is furnished by the Potomac River, which passes through the Allegheny Mountains at Cumberland, Md., the route of the old Cumberland Road. Other routes, involving even steeper grades, may be found following various rivers, notably the Susquehanna, and thence to the head-waters of the Ohio.

The New York Central has the great advantage of occupying one of the two best natural routes, the Grand Trunk occupying the other—which is a circuitous one so far as the United States is concerned. The Baltimore and Ohio gets out through the Potomac valley, while the Pennsylvania works its way over the Alleghenies between the Susquehanna and the Ohio via the Juanita and the Conemaugh branches. The relative nearness to Chicago of Baltimore and Philadelphia partly compensates the Baltimore and Ohio and the Pennsylvania lines for their less advantageous routes.

The distances between New York and the main western termini via various Trunk Line routes are shown in the following statement, together with the highest point surmounted by each:

Route	New York to Chicago	New York to St. Louis	Highest Point above Sea Level
	Miles	Miles	Feet
Pennsylvania	908	1,052	2,192
Lackawanna-Nickel Plate	919	1,115	1,115
New York Central	978	1,157	920
Erie-Wabash	998	1,174	1,173
Baltimore and Ohio	1,013	1,117	2,374

The two intermediate points already referred to—Buffalo and Pittsburgh—are the gateways between the Mississippi Valley and the seaboard. Buffalo is notable as a transshipping point for lumber, grain, ore, and coal, and owes its position largely to advantages in water transportation. Pittsburgh is perhaps even more important as a transportation center, and through this gateway flows what is probably the heaviest railway tonnage in the world. As everyone knows, there is concentrated in the Pittsburgh region an enormous aggregation of iron and steel manufacturing industries.

One of the notable characteristics of the Trunk Line district is the prevalence of water competition. On the north stretch the Great Lakes and on the south flows the Ohio River, and both these bodies of water carry a considerable volume of traffic. On the west the Mississippi River flows to the Gulf, offering the possibility of shipping goods in that direction, thus diverting some traffic from the Trunk Lines. This situation, the Great Lakes being the chief factor, has materially affected the rate structure in the district.

While referring to the competitive situation, we may note that another factor affecting the Trunk Lines has been the existence of a net work of smaller roads running in a general north and south direction and forming a series of "transverse feeders." A number of these transverse lines have been independent and, owing to their ability to throw their traffic to any one of the Trunk Lines which they cross, they have been a very disturbing factor concerning which more will be said on another page.

The most important factors in Trunk Line traffic are:

1. Connection with roads serving the West and South. These roads must connect directly with Western Trunk Lines and have access to southern "gateway" points on the Ohio River. Good western connections, too, involve access to gateways other than Chicago, where congestion is apt to arise, such as the Peoria gateway on the Illinois River, or the Lake Michigan car ferries.
2. Access to coal; they must have connection with the great soft-coal fields in the territory.
3. Access to iron- and steel-producing centers. Each must secure a portion of the heavy traffic which these centers afford.

Any line which lacks these connections is seriously handicapped in competition.

Reasons for Traffic Density.—In the territory through which the Trunk Lines run lies the heart of the nation's manufacturing industry. The New England manufactures are chiefly of the lighter sort, while in this territory we find more of the heavy manufactures, including iron and steel and their products, large oil refineries, copper refineries, cement plants, and similar industries. In the western part are large meat-packing plants. Along with these manufactures goes a dense population, which, both in its consumption and production, has the double significance of furnishing heavy passenger traffic and requiring a dense movement of freight.

All the parent Trunk Lines touch the Pennsylvania coal fields, which is an important factor in understanding their traffic.

Traffic Characteristics—Unbalanced Freight Movement.—The chief traffic of the Trunk Lines consists of raw materials moving eastward and manufactured products and coal moving westward. The largest items in the eastbound traffic are grain, lumber, ore, and packing-house products, and a very considerable part of this traffic, particularly the grain, is for export. The westbound movement consists of various manufactured products and merchandise, together with coal for use in the Middle West. It is true that, with the development of manufactures in the West, the difference between the eastbound and westbound streams of traffic is not so great as it once was, but the distinction is still significant and is likely to remain so for a good many years.

The percentage of agricultural products moving over the Trunk Lines is large in absolute figures, but is small in proportion to the total. It may be said that about 60% of their tonnage is the product of mines, about 20% is manufactures, and only 6% to 8% consists of products of agriculture and animals. Moreover, the proportion of agricultural products is likely to remain small, owing to the fact that the Middle West now consumes more than it did a generation ago and turns more corn into cattle and dressed beef before shipping. Also the railways serving the Gulf ports have diverted an increasing proportion of the western grain.

As a result of the difference in the kind of freight moving east and west, the larger tonnage is found in the eastbound stream. Back in 1903 the total eastbound freight movement over the Pennsylvania lines was 84,401,000 tons, while west bound the tonnage was only 48,572,000, or only a little over one-third of the total. A similar though less striking difference still exists. This excess of eastbound traffic means a large empty car mileage westbound, as the equipment must be balanced even though the tonnage is unbalanced. In 1907 the Interstate Commerce Commission for the last time published figures showing the mileage of loaded and empty freight-cars in different directions. In that year the mileage of loaded freight-cars in the Trunk Line district was 22% greater eastbound than was the westbound mileage, and the mileage of empty freight-cars moving back toward the west was 42% greater than the empty mileage eastbound.

A concrete illustration of the situation is revealed in the annual report of the Baltimore and Ohio Railroad Company for 1920, which contains the following figures:

Home and Foreign Freight Equipment Mileage
Baltimore and Ohio Railroad

	Eastward			Westward		
	Total Freight-Car Mileage	Percentage Loaded	Percentage Empty	Total Freight-Car Mileage	Percentage Loaded	Percentage Empty
1915....	390,173,000	74.8	25.2	382,731,000	47.2	52.8
1920....	482,786,000	79.4	20.6	480,737,000	49.4	50.6

These figures indicate a considerable dominance of eastbound freight traffic, and it is to be noticed that the percentage of loaded car mileage is very much higher in that direction. While not conclusive evidence in themselves, the figures indicate that for this line at least the lack of balance was somewhat decreased during the five years covered.

Density of Freight Traffic.—The rather unbalanced traffic of Trunk Lines is more than offset by the fact that these roads have a greater density of freight traffic than any other large group of roads in the country. As we have seen, the average of the ton-miles per mile of line for all the railways was 1,698,000 in 1917. In that year, the range of density on the four main Trunk Lines was from 3,633,000 on the Baltimore and Ohio, up to 6,115,000 on the Pennsylvania. The average density on the Trunk Lines will probably be in the neighborhood of 4½ million ton-miles per mile of line for some years.

With the exception of the New Haven and a few eastern roads having a large commutation business, the Trunk Lines also have the densest passenger traffic.

Large Trainloads and Local Traffic.—This great density of traffic is the more advantageous because it is hauled in large trainloads. The average trainload for all Class One roads in the United States was 708 tons in 1920. In March of that year the average trainload of the Trunk Lines ranged from 876 on the Pennsylvania, up to 944 on the Erie. With the exception of a few coal carriers, no other roads made such a showing.

Another advantage enjoyed by the Trunk Lines is the importance of "local traffic" on these roads. By local traffic is meant that which both originates and terminates on a given railway as distinct from "through traffic" which is either received from or delivered to other lines. Such traffic is apt to be most profitable for the railways. Two of the four main Trunk Lines have a larger percentage of their freight originating on their own lines than the average for the United States and the average for the group is higher than that for the important New England and Southern roads.

On the other hand, these same Trunk Lines have a large quantity of highly competitive long-haul traffic. Under favorable circumstances, the export grain traffic may be very profitable, but at times in the past it has been hauled at rates which were inadequate.

Large Profits in Spite of Low Ton-Mile Revenue and High Operating Ratios.—An examination of some of the results reported by these great carriers might lead one to think that they surely must be unprofitable. Consider, for example, the following facts. The Trunk Lines have a very low revenue per ton-mile—lower than the receipts per ton-mile of any other group of railways in the country except the Southern and Pocahontas lines. The same roads have very low average receipts per passenger-mile. As a result of these facts their net revenue per train-mile is relatively small. And to make matters look worse, their total expenses are so great that they show a higher operating ratio than do the roads of any other section of the country, their normal ratios (in 1917) ranging from 71% on the New York Central, up to 86% on the Erie. (In 1919 the ratios ranged from 80% to 95.6%.)

But as a matter of fact, the Trunk Lines, as everyone knows, are among the most prosperous and their net earnings per mile of line are normally considerably above the average for the United States or for any large section of the country, ranging (in 1917) from $5,110 on the Erie, up to $12,000 on the Pennsylvania.

The explanation of this showing lies almost entirely in the *freight traffic density* found on these roads. The large volume of their business makes the margin of profit necessary on each ton-mile and passenger-mile small and insures large profits when business is normal. Other factors explaining the large earnings in spite of low receipts per ton-mile and large expenses, are the following:

> 1. The low average receipts per ton-mile are partly due to the large proportion of competitive long-haul traffic which moves in carloads and can be handled at very low unit costs.
> 2. The low revenue per passenger-mile is partly due to the large commutation traffic of some of the roads. For example, the average receipts per passenger-mile of the Erie have been the lowest of the group for this reason.

In general, the low average receipts are more than balanced by the great density of traffic and by the large quantity of freight and number of passengers per car and per train, which explain why the Trunk Lines have such high revenues per train-mile.

Of course, the investment in road and equipment per mile of line should always be considered in connection with earnings. In the case of the Trunk Lines this figure amounts to over $150,000.

Differences among Trunk Lines.—There may be some danger in treating the Trunk Lines as a group of overlooking the differences among them. In the chapter on Railway Statistics a comparison between the Erie and the Baltimore and Ohio was made, showing that in one year, in spite of the Erie's greater density, it had the lower net earnings per mile of road, a fact explained by its smaller carloads and greater operating expense per train-mile. Another comparison which will throw light on the characteristics of these roads and at the same time bring out important differences, is that between the New York Central and the other three. The New York Central generally has net earnings per mile of line similar to those of the Pennsylvania (these two roads making a better showing than the others in this respect), and in 1919 had considerably larger net earnings per mile than any of the Trunk Lines. It also had the lowest operating ratio and the highest net earnings per train-mile. Yet in 1919 the New York

Central had a freight density which was less than that of either the Pennsylvania or the Erie. Its average carload was not so great and its average receipts per ton-mile were lower.

How, then, is the favorable showing of the New York Central as to net earnings to be accounted for? The answer is to be found chiefly in the advantage which that road possesses in its relatively level and straight route. Its low grades and small degree of curvature mean low operating expenses. Thus an examination of the statistics will show that its ratio of "helper" locomotive mileage to total locomotive mileage was much lower than that of any of the Trunk Lines, and its expense per train-mile was also the lowest.

We may conclude this analysis of operating and traffic conditions among the Trunk Lines with a summary table showing the proportions of various commodities in their traffic (New England roads included):

COMMODITY STATISTICS FOR EASTERN DISTRICT
(NEW ENGLAND AND TRUNK LINES)

	% of Aggregate Tonnage Originating on Road	% of Total Freight Tonnage
PRODUCTS OF AGRICULTURE:		
Grain	2.17	2.60
Flour	.47	1.07
Other mill products	.52	.78
Hay	.50	.48
Tobacco	.05	.09
Cotton	.04	.17
Fruit and vegetables	1.14	1.57
Other products of agriculture	.40	.47
Total	5.29	7.23
ANIMALS AND PRODUCTS:		
Livestock	.61	.51
Dressed meats	.26	.44
Other packing-house products	.37	.43
Poultry, game, and fish	.10	.17
Wool	.07	.08
Hides and leather	.17	.22
Other animals and products	.57	.53
Total	2.15	2.38

	% of Aggregate Tonnage Originating on Road	% of Total Freight Tonnage
PRODUCTS OF MINES:		
Anthracite coal	13.96	10.66
Bituminous coal	30.58	32.69
Coke	3.61	3.04
Ores	1.00	4.25
Stone, sand, and other like articles	9.29	6.10
Other products of mines	.58	.81
Total	59.02	57.55
PRODUCTS OF FORESTS:		
Lumber	2.00	3.73
Other products of forests	1.25	1.25
Total	3.25	4.98
MANUFACTURES:		
Petroleum and other oils	1.72	1.79
Sugar	.38	.39
Naval stores	.11	.09
Iron, pig and bloom	1.68	1.51
Iron and steel rails	.44	.38
Other castings and machinery	2.26	2.00
Bar and sheet metal	3.37	2.99
Cement, brick, and lime	3.57	3.19
Agricultural implements	.14	.13
Wagons, carriages, tools, etc.	.64	.58
Wines, liquors, and beers	.15	.15
Household goods and furniture	.17	.17
Other manufactures	5.29	5.25
Total	19.92	18.62
MISCELLANEOUS COMMODITIES not specified above (carload rates)	5.58	4.61
L. C. L. (less-than-carload) Goods not distributed above	4.79	4.63
Grand Total	100.00	100.00

CHAPTER VIII

THE COAL ROADS

THE ANTHRACITE ROADS

The Roads and Their Location.—The anthracite roads, so called because of the important position occupied in their traffic by anthracite coal, include a small group of relatively short carriers operating in eastern Pennsylvania, New Jersey and New York (see Fig. 13). The roads comprised within this group are:

1. Philadelphia and Reading Railway Co. (Philadelphia to Mt. Carbon, Pa.)
2. Central Railroad of New Jersey (Jersey City to Scranton, Pa., via Phillipsburg, N. J.)
3. Lehigh Valley Railroad Co. (Jersey City to Buffalo, via Wilkes-Barre)
4. Delaware, Lackawanna and Western Railroad Co. (Jersey City to Buffalo, via Scranton)
5. Delaware and Hudson Co. (Wilkes-Barre to Albany—branch to Rouse's Point, N. Y., near the Canadian border)
   Albany and Susquehanna Railroad Co.
6. New York, Ontario and Western (controlled by the New Haven), (Cornwall, N. Y., to Oswego, N. Y.; with a leased line to Scranton)

The New York, Ontario and Western reaches New York harbor by agreement with the West Shore Railway.

These roads are all short, the operating company owning in each case from 200 to 400 miles of line and controlling by lease or otherwise a few hundred miles more.

All the anthracite roads serve to connect the anthracite coal fields with tide water at New York or Philadelphia, generally following the route of some old canal, pursuing the valleys of the Susquehanna, the Schuylkill, and Delaware rivers.

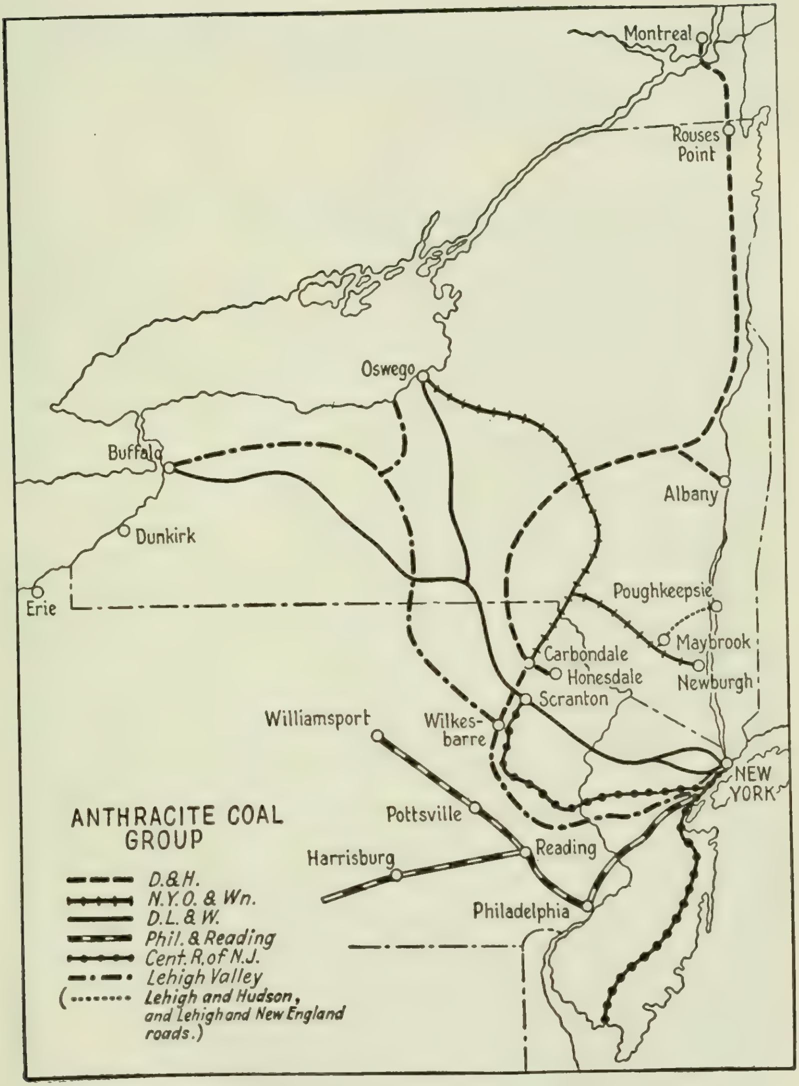

Fig. 13.—Anthracite Coal Roads

Most of them strike north to the Great Lakes–St. Lawrence Valley and reach Lake Erie, Lake Ontario, or the St. Lawrence at Buffalo, Oswego, or Montreal.

A few other railways, notably the Erie and the Pennsylvania, have a large anthracite coal traffic, but they have other traffic which outweighs the anthracite in importance, and a wider sphere of influence.

Relation between the Railways and Coal Mines.—All the anthracite roads are pretty closely affiliated with the ownership of coal lands and the mining of coal. Formerly, each of them directly or indirectly owned coal lands. As the result of legislation by the federal government they have recently taken steps to segregate their coal properties, with the general result that those properties are now related to the railways through a mere community of stockholding, the stockholders of the railways having been given the right to purchase the stock of the new coal companies that have been organized.

Fairly typical of the general situation is the history of the Delaware, Lackawanna and Western. Prior to 1909 the railway owned coal lands, mined coal, and sold it, in addition to performing its functions as a carrier. About the time the so-called "commodities clause," which prohibits a railway from transporting commodities produced or owned by it, was added to the Interstate Commerce Commission law, the railway organized the Delaware, Lackawanna and Western Coal Company which acted as a selling concern. Further action by the government led it in September, 1921, to dispose of its coal properties, turning them over to the Glen Alden Coal Company. The Glen Alden shares were offered to the railway's stockholders, and Glen Alden bonds were issued to the railway company. In March, 1927, Glen Alden bonds were turned over to the Lackawanna Securities Company, formed in that year as the last step in the complete segregation of the coal properties. A proposal was then made to distribute Lackawanna Securities Company stock to the Delaware, Lackawanna and Western stockholders and this feature of the plan has met the approval of the Interstate Commerce Commission.

Nature of the Anthracite Industry as Affecting Transportation—Natural Monopoly.—The only factor which we need to discuss as a general background for understanding the anthracite roads is the nature of anthracite coal. This commodity has a number of peculiarities which largely determine the operation of the anthracite roads.

In the first place, the mining of anthracite coal is what economists call a "natural monopoly." By this is meant a monopoly which arises from the nature of the product or the process required to produce it, and may be said to be inherent in the nature of the industry. A primary cause of natural monopoly in this case is the narrowly restricted area in which anthracite coal is found. Practically all the anthracite coal in this country is found in a small area of 480 square miles in the northeastern part of Pennsylvania. Naturally the anthracite lands were bought up long ago and are held by a very few companies. In 1921, 75% of the output was produced by a group of eight companies. Under such circumstances, competition, as it springs up, becomes cutthroat and soon ceases. In the case of anthracite coal the monopoly element based on limited natural resources is reinforced by other factors of an economic character which will appear among the following points.

The most important demand for anthracite (that for the "prepared sizes") is a seasonal demand depending upon the heating and cooking requirements of the household. The peak comes in the fall and winter months and declines in summer. But equipment and labor required to handle the peak load must be maintained, and consequently there is an annual capacity in excess of demand. This inevitably results in a tendency to overproduction, which is one of the reasons why competition does not work successfully in the anthracite coal industry.

The foregoing situation is accentuated by the fact that storage is not practicable. It would be expensive, as the cost of loading and unloading at storage bins would be great—to say nothing of the "degradation" which results from handling —while storage on wheels would mean too great an investment. Anthracite coal, too, deteriorates, becoming "rusty" and losing in market value.

Dependence of the Carriers on Coal Traffic.—Finally, this product has an unusually close relation to transportation. The anthracite roads, like their predecessors, the tidewater canals, were built primarily for the purpose of hauling coal. As they depended almost entirely upon it for their traffic, they naturally sought to equalize the working of the mines so that they might operate the year around on a steady basis. They have always sought to stabilize production. It is well to recognize that when an industry and a railway are so vitally interdependent, the two must jointly partake of the nature of the railway and be affected with a peculiar public interest.

To some extent the development of population and other industries within their territories have modified the intense dependence of the anthracite roads upon their mines; and, like the Central of New Jersey and the Delaware, Lackawanna and Western, these roads have expanded the scope of their business. Nevertheless, it is likely that with one or two exceptions they will long retain their peculiar characteristics.

As the anthracite roads do not dominate any clearly defined territory, it is practically impossible to compare their tracks and equipment with any unit or area of population. It is of some interest, however, to note that these roads have an unusually high capitalization per mile of line—probably the highest of any group of roads. The Lackawanna and the Lehigh Valley railways, for example, are capitalized at about $440,000 per mile. This is at least partly due to the expensive construction required to enable the economic hauling of heavy coal traffic over steep grades and sharp curves which are caused by the semi-mountainous territory surrounding the coal fields.

Percentage of Anthracite in Traffic.—A natural question that arises in one's mind is, What proportion of coal must there be in a road's traffic to warrant calling it a coal road? The commodity statistics show that the most typical ones of the anthracite roads—the Lackawanna, the Lehigh Valley, the Delaware and Hudson, and the New York, Ontario and Western—all have more than 40% of their revenue freight tonnage in the shape of anthracite coal. In addition, the traffic of the first three of these roads contains from 18% to 20% of other products of mines. Accordingly, we may say that an anthracite road is, as a rule, one whose traffic consists to the extent of over 40% of anthracite coal. Anthracite coal has been over 60% of the tonnage of the New York, Ontario and Western.

The Central of New Jersey has a traffic which contains about 27% of anthracite and a similar quantity of other products of mines, and may accordingly be classed as an anthracite road to a less extent than the others; while the Philadelphia and Reading is losing its former character as an anthracite road to a very large extent. Its bituminous tonnage has so increased as to exceed its anthracite tonnage considerably, and its merchandise traffic is also heavier. Only 22% of its tonnage is anthracite.

It may be safely stated that over one-third of the operating revenue of an anthracite road comes from its anthracite coal traffic and in some cases as much as over one-half.

Salient Traffic Characteristics.—The salient characteristics of the traffic of the anthracite roads are nearly all connected with the coal industry. Some of the most obvious ones are the following:

A large percentage of the traffic originates on the line of the road which hauls it to destination.

A similarly large part of the traffic is pretty closely controlled by the railway, or, more accurately speaking, is controlled by the same interests which also control the railway.

The bulk of the traffic moves to tidewater points, only about 20% of all the anthracite coal going to the west.

As a result of this predominance of movement to tidewater there is rather a large empty-car-mileage. The proportion of empty cars on the anthracite roads has averaged about 33%, and while not quite as large as in the case of the Trunk Lines, it is above the average.

Also connected with the nature of the traffic is the relatively short haul, the distance moved by the average ton being only a little over 115 miles as compared with the United States average of about 180 miles and a Trunk Line average in the neighborhood of 200 miles.

High Net Earnings Per Mile.—The outstanding characteristic, however, is the high net earnings per mile of road, which, in turn, are due to an extremely dense freight traffic coupled with a very large freight revenue per train-mile. The net operating revenue per mile of road is, on the average, even larger than that of the Trunk Lines and is probably the largest of any group of railways in the United States. In 1917 the net earnings of the chief anthracite roads averaged over $12,000 per mile.

This favorable showing is partly due to the extremely dense freight traffic. The Philadelphia and Reading probably has the greatest freight density of any important common carrier in the world.[1] Its ton-miles per mile of line in 1917 were 6,565,000, or 550,000 greater than the showing of the Pennsylvania.

More than this, the anthracite roads have an unusually high revenue per ton-mile, which, coupled with their large trainloads, means a very large revenue per freight-train-mile.

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[1] Exceeded only by a few ore and soft-coal carriers such as Bessemer and Lake Erie and Pittsburg and Lake Erie.

In the latter respect, they make the strongest showing of any group of railways in the country, in which they are led by the Delaware, Lackawanna and Western.

The high revenue per ton-mile received by the anthracite roads may be explained by the fact that anthracite coal in all the eastern territory moves on rates which are established by individual lines. Due to the relation between the carriers and the coal traffic which have been described, it is natural that rather high rates, considering the grade of the traffic, are charged. Also the anthracite roads have a rather high percentage of manufactured products which helps to bring up the ton-mile revenue.

Dense Passenger Traffic.—Several of the anthracite roads, in addition to the strong showing as to freight traffic, have the advantage of an extraordinarily dense passenger traffic. The most notable of these are the Delaware, Lackawanna and Western and the Central of New Jersey, both of which, in 1919 had over 670,000 passenger-miles per mile of line against an average for the United States of 198,000. This showing in both cases is chiefly due to the large commutation business within the 50-mile zone around New York City. The average for the whole group, however, would be in the neighborhood of 350,000 passenger-miles, which is exceeded by only a few of the New England roads and Trunk Lines.

THE POCAHONTAS ROADS

The Roads and Their Location.—The Pocahontas roads, sometime called "soft coalers," (see Fig. 14) are so called because they serve the celebrated Pocahontas coal district, and the bulk of their traffic consists of soft coal. This group consists of the following roads:

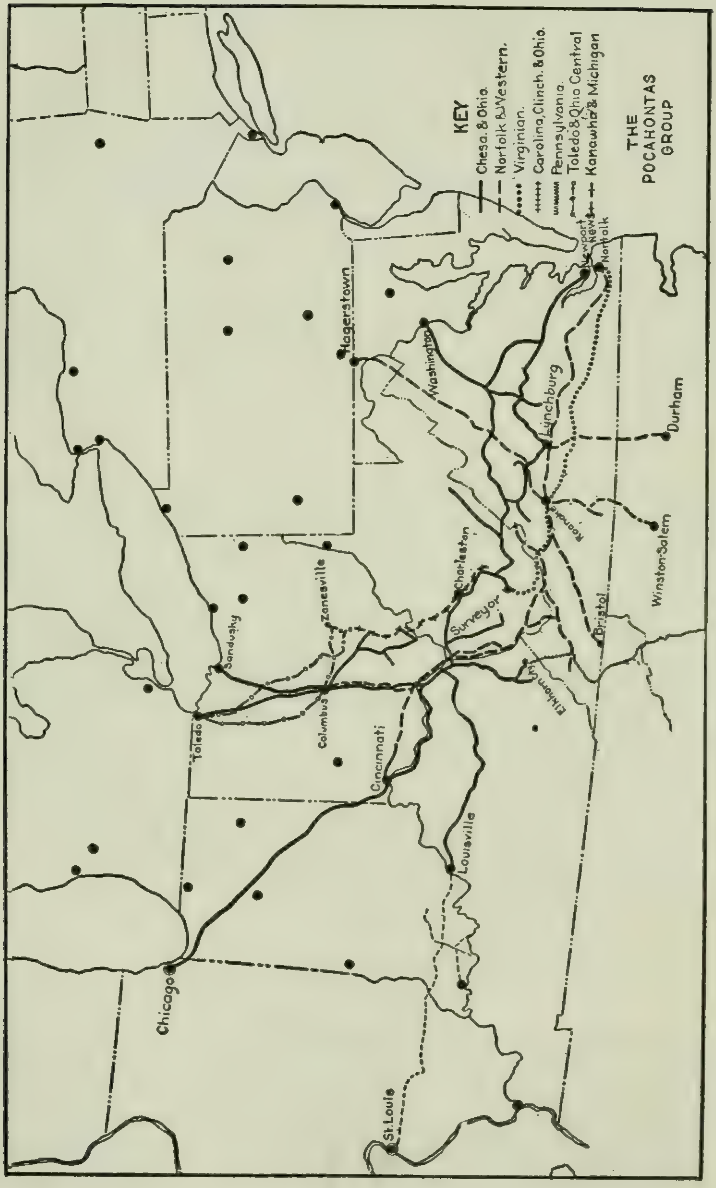

Fig. 14.—The Pocahontas Roads

1. Chesapeake and Ohio Railway Co. (Fort Monroe and Newport News, Va., to Cincinnati, with trackage rights into Chicago)
   Hocking Valley Railway Co. (to Toledo, Ohio), (Affiliated with New York, Chicago and St. Louis, and Lake Erie and Western)
2. Norfolk and Western Railway Co. (Norfolk to Cincinnati; trackage rights to Columbus, Ohio)
3. Virginian Railway Co. (Deepwater, West Va., to Sewell's Point, Va., near Norfolk)

These roads all extend from the West Virginia coal fields to tidewater in the neighborhood of Norfolk. The two chief lines, the Chesapeake and Ohio, and the Norfolk and Western, run down the west slope of the Alleghenies into the Middle West. To some extent, therefore, the Pocahontas roads resemble the anthracite roads, but, as we shall see, their operations are on a more extensive scale and they serve a less densely developed industrial region.

All these roads are of relatively recent development and the Virginian Railway only began operation in 1909. The Norfolk and Western is a Virginia corporation of 1896, created after the foreclosure of early companies, and the Chesapeake and Ohio is a West Virginia corporation of 1878, which was reorganized in 1888.

Their Relation to Coal.—The Pocahontas roads own large bituminous coal properties, chiefly in West Virginia. The Norfolk and Western owns nearly all the stock of the Pocahontas Coal and Coke Company and of the Virginia Holding Corporation, while the Chesapeake and Ohio in 1917 acquired the Western Pocahontas Fuel Company and owns other coal lands.

These coal lands lie in the mountainous area of West Virginia and the roads cross the Alleghenies. This makes heavy grades and sharp curves, but the grades are favorable to the heavy traffic, which originates at the highest points on the line. To even a greater extent than the anthracite roads, the railways now under discussion are specialized in coal carrying. An examination of the commodity statistics will show that in their case only one commodity need be considered—soft coal. Indeed, 75% of the tonnage of the Chesapeake and Ohio, and Norfolk and Western, consists of mineral products, nearly all of which is coal; and the Virginian Railway hauls over 90% bituminous coal.

Differences among the Pocahontas Roads.—The chief individual variations are the following: The Chesapeake and Ohio hauls a considerable tonnage of grain for export, thus showing a trace of the Trunk Line character, and, as already noted, with its entrance into Chicago this road became a factor in the Trunk Line situation. Its recent affiliation through common ownership with the New York, Chicago and St. Louis and subsidiaries gives it a broad outlet for coal to the North and West, and increases its claim to be a "Trunk Line." The Norfolk and Western hauls considerable quantities of coke and ore, together with an appreciable percentage of manufactured products, and it is to be noted that this road serves in part a more highly developed industrial section. It has been controlled through stock ownership by the Pennsylvania Railroad.

Large Originating Tonnage; but Unbalanced Traffic.—Owing to the traffic conditions thus outlined, one can readily infer the situation as to *percentage of freight originating* on the line. An extraordinarily large percentage of the traffic of the Pocahontas roads originates on their own lines. Such traffic is about 75% of the total, the highest percentage of any group of railways in the country. It is probable that with industrial development, however, they will gradually come to receive more freight from connections.

Under the circumstances outlined thus far, what must one infer as to the *balance* of the traffic on Pocahontas roads?

There can be but one answer in view of the predominance of the coal mining in West Virginia. Probably the Pocahontas roads have the most unbalanced traffic of any important lines in the country. They move heavy coal trains down grade from their West Virginia mines and have but little to haul back. As a result, they have a very large average proportion of empty cars per train and are even less favorably situated in this respect than the Trunk Lines and the anthracite roads. In both 1920 and 1921 their percentage of loaded car-miles—61% and 57% respectively—was the lowest of any group, the average for Class One roads in the United States being 68% in 1920 and 63% in 1921.

From the mines the coal moves both east and west. The eastbound tonnage is generally the larger, as appears in the following table, but since 1922 the opposite has been true due to heavier coal movement to the west and northwest from non-union fields.

Coal Traffic on Pocahontas Roads

Year	Eastbound (net tons)	Westbound (net tons)	Total (net tons)
1916	17,707,774	14,923,207	32,630,981
1917	16,484,291	14,880,111	31,364,402
1918	18,410,546	11,470,665	29,881,211
1919	13,222,400	12,285,071	25,507,471
1920	16,480,516	10,564,197	26,945,713

There are two grades of coal produced in the Pocahontas territory. One is a highly volatile, smokeless grade suitable for bunkering ships, and this mostly moves to the east. The lower grade, "gas coal," is chiefly shipped into the Middle West, and into the Northwest via the Great Lakes.

It must not be thought, however, that in the case of the Pocahontas roads, this extremely unbalanced traffic results in unprofitable operation. Their traffic has several features which more than compensate.

1. The heavily loaded trains move *down grade,* while it is the empties that have to be hauled up.

2. They have a very *long haul,* ranging in 1919 from an average of 264 miles on the Norfolk and Western up to 353 miles on the Virginian—a longer average haul per ton than is found on any eastern roads.

3. Perhaps as important as any of the compensating features is the very *rapid movement* secured on these lines, their average car-miles per car day being greater than that found in any other section. In 1920 when business was good the average number of car-miles per car day for the Pocahontas region was 35.3 against a United States average of 25.1, and in 1921 the region averaged nearly 24 miles per car day as against 22.4 for all Class One roads.

Low Ton-Mile Revenue; High Total Net Revenue.—From the revenue point of view, one naturally reflects that the predominance of bituminous coal, which classes as a low-grade commodity, must result in low receipts per ton per mile, and it is true that the *ton-mile revenue* of the Pocahontas roads is remarkably low. It was as low as 45 hundredths of a cent in 1917, and it runs more than 3½ mills under the average for the United States.

The ton-mile revenue prevents the receipt of high gross revenue per freight-train-mile even though the trainloads are large.

How, then, is the fact that the Pocahontas roads have a very high net revenue both per train-mile and per mile of road to be explained? Their train-mile net, which normally runs well over $1.00, is exceeded by few lines. Their net per mile of road in 1917 ranged from $6,856 on the Chesapeake and Ohio up to $11,867 on the Norfolk and Western, a showing which places them in the same class with the Trunk Lines. The answer to the question is not to be found in the density of their traffic, although this is about the same as that of the Trunk Lines and the anthracite roads and consequently is great. We have seen that it is not to be found in the balance of their traffic. Rather it is found in the three following factors:

> 1. Heavy trainloads. The Pocahontas roads have the heaviest average trainloads of any group of railways in the United States. Their net tons per train average about 1,200. The Virginian Railway has an average of about 1,700 tons per train.
>
> 2. Large carloads. The average net tons per loaded car for these roads is 42, as against an average for the United States of about 28. This means a large percentage of net weight compared with gross weight, and the Pocahontas roads have the largest ratio of net ton-miles to gross ton-miles (excluding locomotive and tender) of any roads in the country. In 1920 it was 54% as against 49% for the United States, and in 1921, 49% as against 45% for the country.
>
> 3. Rapid movement of cars.

These appear to be the chief operating characteristics which enable the Pocahontas roads to offset their low ton-mile revenue and to show large net earnings per mile. The cost per *ton*-mile of the chief items of train operating expense is very considerably less than that in any other group of railways, although these expenses per *train*-mile are somewhat above the average for the country as a whole, a situation which can only be explained by the three factors just mentioned coupled with the favorable grades in the direction of the heavy traffic and the low cost of their fuel.

Very Low Operating Ratios.—In 1917 the Norfolk and Western had the lowest operating ratio of any great eastern railway system, its figure being 62%. The Virginian Railway, with an operating ratio of 55%, was excelled in this respect by only a handful of railways throughout the whole country, none of which had so dense a traffic. The Chesapeake and Ohio, with a ratio of 69%, was below the average.

CHAPTER IX

SOUTHERN RAILWAYS

Chief Southern Roads.—The railways of the South (see Fig. 15) have their peculiar characteristics arising from the industrial and social conditions in that section. These roads, as we shall see, vary rather widely among themselves, but they have enough in common to warrant discussing them as a group. Great development has taken place in the South during the last generation, and more is to come; consequently, the student of railway geography must be specially alert to make allowance for change in considering this group of roads.

The chief railways of the South are the following:

1. Atlantic Coast Line Railroad Co. (Richmond, Va., to Jacksonville, Fla., and other Florida points)
   Louisville and Nashville Railroad Co. (New Orleans to St. Louis, Louisville, and Cincinnati)
   Nashville, Chattanooga and St. Louis Railway
2. Seaboard Air Line Railway Co. (Richmond, Va., to Tampa, Fla.)
3. Southern Railway Co. (Washington to Mobile and New Orleans, via Atlanta and Birmingham; reaches Cincinnati and St. Louis)
   Alabama Great Southern Railroad Co.
   Georgia Southern and Florida Railway Co.
   Mobile and Ohio Railroad Co.
   New Orleans and Northeastern Railroad Co.
   Cincinnati, New Orleans, and Texas Pacific Railway Co.
4. Illinois Central Railroad Co. (Chicago to New Orleans)
   Chicago, St. Louis and New Orleans Railroad Co.
   Central of Georgia Railway Co. (Birmingham to Savannah)
   Yazoo and Mississippi Valley Railroad Co.

The Atlantic Coast Line, the Seaboard Air Line, and the Southern have part control over the Richmond, Fredericks-

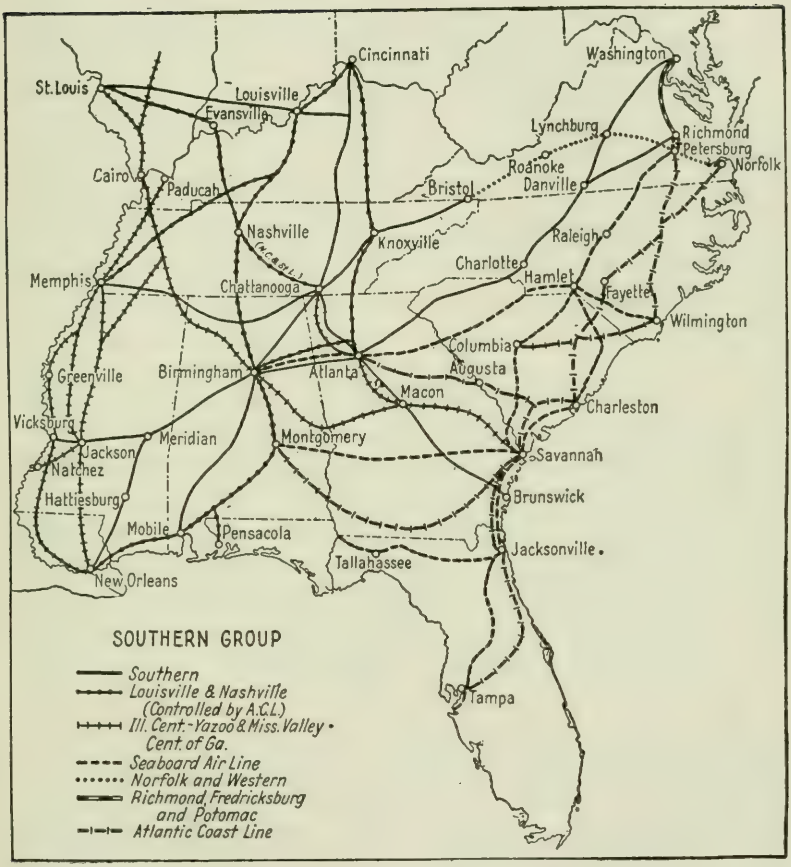

Fig. 15.—Southern Roads

burg and Potomac Railroad, a short line between Richmond and Washington which serves as a "bridge" between the two seaboard routes and the North.

Direction and Grouping of Southern Lines.—At a glance it is obvious that these chief southern railway lines have a general north and south trend. The Trunk Lines and the Pocahontas roads extend east and west to connect Chicago and St. Louis with the northern Atlantic ports. There is no such great agricultural and manufacturing territory back of the southern ports, however, and even if there were the Gulf ports to the south would divert the traffic. On the whole, it may be said that the chief railways of the South have been built and developed for one or more of the following reasons:

1. To exchange the agricultural products of the South for the manufactures of the Northeast.
2. To exchange the agricultural products of the South for the grain and manufactures of the Middle West.
3. To haul the cotton raised in the South to the nearest ports—Wilmington, Charleston, Savannah, Jacksonville, Pensacola, Mobile, and New Orleans. This fact will explain the general North and South trend of the roads with their local concentration upon a number of ports.

The various great Southern systems mentioned may be subdivided into groups. One way of looking at the matter would be to emphasize the Allegheny Mountains and to point out that east of those mountains lie the Atlantic Coast Line and the Seaboard Air Line, together with the main stem of the Southern Railway, stretching from Washington to Atlanta; while west of the Alleghenies lie the Illinois Central and the Louisville and Nashville, together with the network of southern railways which extends from New Orleans and Mobile to St. Louis and Cincinnati. The eastern, or seaboard, lines may be roughly said to connect the Virginia cities and Washington with Atlanta and the southern ports, such as Jacksonville; while the western or Mississippi Valley lines in the South radiate from New Orleans and Mobile to the Ohio River crossings and Memphis.

In reality, when the matter is looked at more from the traffic point of view, there are three railway areas in the South:

1. The Seaboard Area
    Atlantic Coast Line and Seaboard Air Line
2. The Mountain Area
    Southern Railway (main line) and Louisville and Nashville
3. Mississippi Valley Area
    Illinois Central
    Yazoo and Mississippi Valley
    Southern Railway (Mobile-St. Louis lines)

The Gateways to Southern Territory.—On account of mountains and rivers the Southern railways have been focused on a number of "gateways," or points at which these natural barriers could be most conveniently crossed. The chief of these points are the various "Ohio River Crossings," the "Virginia Gateways," and Atlanta, Georgia.

The principal "gateways" for the flow of traffic into and out of Southern territory are as follows:

1. *At Hagerstown, Md., Potomac Yard,* and Richmond and Norfolk, Va., the Eastern Trunk Lines connect with the railways which run in a southwesterly direction through the Carolinas to the Southeast and the Mississippi Valley.
2. At the *Virginia cities* of Roanoke, Lynchburg, Richmond, Petersburg, and Norfolk, the so-called "Pocahontas" lines connect with the Carolina lines.
3. At the *Ohio River crossings* of Cincinnati, Ohio, Louisville, Ky., Evansville, Ind., and Cairo, Ill., the Central Freight Association roads connect with the lines leading into the South. At Cairo also lines leading from Western Trunk Line territory meet lines running from Cairo to the Southeast and Mississippi Valley.

4. At the *lower Mississippi River crossings,* which are Memphis, Tenn., Vicksburg and Natchez, Miss., and Baton Rouge and New Orleans, La., the southwestern lines interchange traffic with the Mississippi Valley lines.
5. At the *South Atlantic ports,* Wilmington, N. C., Charleston, S. C., Savannah, Ga., Brunswick, Ga., and Jacksonville, Fla., there is a heavy movement of traffic between the eastern cities and the south by rail and water routes. Of course, export and import traffic is handled.
6. At the *Gulf ports,* New Orleans, La., Mobile, Ala., and Pensacola, Fla., import, export, and coastwise traffic is handled as at the South Atlantic ports.

The Territory—Supply of Transportation Facilities.—The Southern territory, including the states south of the Ohio and Potomac rivers and east of the Mississippi, is much larger than any of the areas covered thus far. In this territory there are a little over 38,000 miles of road in operation, which is a small mileage in relation to area. Neither is the South very well equipped with railways in proportion to its population. Without going into detail, it may be said that in proportion to area the South is just a little better equipped than the average for the whole United States, while in proportion to population it is just about average. As to both locomotives and cars, the Southern territory is somewhat below the average for the United States, but not dissimilar to conditions prevailing in the West. The investment per mile of railway is relatively low.

Physical and Economic Characteristics Affecting the Railways.—The presence of the great barrier of the Allegheny Mountains, which stretches in a southeastern direction from West Virginia nearly to Atlanta and Birmingham, has affected the general direction of the Southern roads, as already indicated, and has given rise to the importance of several gateway points, among which Atlanta is the most notable.

On the west lies another great barrier in the shape of the Mississippi River. While, in a sense, that river is a highway of commerce, yet from the point of view of railway men desiring to extend their roads to the West, it is an obstacle. There is no bridge across the Mississippi River south of Memphis, Tenn., and ferries have to be relied upon at the Vicksburg and New Orleans crossings. Such great railway systems as the Southern, the Texas and Pacific, and the Southern Pacific, run to the river and terminate there. Cotton eastbound from the Southwest sometimes goes up around by St. Louis.

Water competition is an important factor in the Southern territory. Bounding it on two sides are the Atlantic Ocean and the Gulf of Mexico; on the other two sides flow the Ohio and Mississippi rivers; while such streams as the Mobile, Tennessee, and Cumberland rivers are navigable to an appreciable extent.

The relative nearness of the Southern ports to grain-producing regions is a factor which has already some importance and may become more important in the future. Even such ports as Wilmington, Charleston, and Savannah are nearer to Kansas City than is New York; while Pensacola, Mobile, and New Orleans are much nearer.

The population of the South is relatively sparse, with a rather low percentage of urban dwellers. It is heavily diluted with an illiterate negro element. In the past the railways have done much to promote emigration from the North to various sections, but the population situation will long be a drawback to industrial and traffic development.

Chief Industries—Agriculture and Lumbering.—Agriculture, together with lumbering, is still the dominant industry in this section. Accordingly, the chief products are cotton, lumber, fruits and vegetables, rice, etc. Nevertheless, foodstuffs are largely imported; for so large a part of the arable land is put to cotton that the people are dependent upon the northern states for a considerable portion of their grain and meat. The livestock production of this section, however, is rapidly growing.

To the west of the Alleghenies there is a considerable mining area, producing both coal and iron ore. As a result, the Louisville and Nashville, and the Illinois Central both have a large volume of mineral traffic.

Traffic Characteristics.—As to the proportion of lumber and agricultural products hauled, there are two groups of Southern carriers.

1. The seaboard lines and the Mississippi Valley lines both have a large percentage of lumber and agricultural products, as appears in the statement which follows:

	Forest Products	Agricultural Products
Seaboard Air Line	26%	12%
Atlantic Coast Line	35	12
Yazoo and Mississippi Valley	37	20
Southern	19	10

2. On the other hand, what may be called the Allegheny lines touch large coal and iron deposits in the mountainous regions near Birmingham, and therefore haul a fairly large proportion of mineral products and a small percentage of agricultural and forest products.

	Products of Mines	Agricultural Products
Louisville and Nashville	69%	8.4%
Illinois Central	48	14
Southern	40	10

The Southern Railway, on account of its wide ramifications, partakes of the characteristics of both groups; and it is to be remembered that the Yazoo and Mississippi Valley is controlled by the Illinois Central.

Large Agricultural and Forest Traffic—Cotton Relatively Unimportant.—Perhaps the most notable characteristic of the traffic of the Southern roads, therefore, is the large proportion of agricultural and forest products. As such products have relatively low specific value, this means that the net revenue per train-mile must be relatively low.

Cotton, which is the chief factor in southern industry, supplies a relatively small tonnage, as it is rather light and bulky. A good total cotton crop for the whole South, including Texas, is about 12,000,000 bales, which weigh only 3,000,000 tons. This is a very small fraction of the total tonnage hauled by the railways of the United States—less than one-fourth of one per cent. Something like one-half of the cotton has generally been exported, with New Orleans and Savannah as the chief southeastern ports; but the cotton movement through the South Atlantic ports has declined relatively on account of the increased movement via Galveston and the growth of domestic cotton manufacturing in North Carolina, South Carolina, and Georgia.

Throughout a good part of the year there is a heavy movement of various kinds of fruits and vegetables from the South to the North, the shipments beginning early from the southernmost points, the shipping area moving north with the season. There are interesting characteristics of the individual roads, such as the large tonnage of peaches which originates on the Central of Georgia, and the heavy movement of imported bananas shipped north from New Orleans over the Illinois Central.

Lumber and other forest products bulk very large in the traffic of the Southern roads, especially on the seaboard carriers, on which these products comprise over 30% of the tonnage originating on their own lines. Products of the forest also make up from 8% to 16% of the tonnage originating on the main Southern roads in the Mississippi Valley area. It is to be noted, that while yellow pine is the chief item, Memphis is the center of the hardwood industry of the country.

The chief items of traffic shipped into the South from the North are dry goods, boots and shoes, machinery, and various manufactures of metals from the Northeast; and grain, packing-house products, agricultural implements and vehicles, boots and shoes, and cereal manufactures from the Central West.

Direction of Traffic.—On the seaboard railways there is a strong predominance of northbound tonnage, which has increased with the growth of the citrus fruit production. The railways to the west of the Alleghenies, on the other hand, have a more even balance, but their southbound traffic, such as grain, packing-house products, and bituminous coal, predominates. Exports via the Gulf ports play a part in the western group.

Low Traffic Density and Net Revenue.—In keeping with what has been said about the relative sparseness of population and the predominance of agriculture, is the fact that the Southern roads as a whole show a very low density of freight traffic. The number of ton-miles per mile of line ranges from a little less than 700,000 on the Seaboard Air Line up to over 2,300,000 on the Illinois Central. The average for all Southern roads is in the neighborhood of 1,600,000 ton-miles per mile of line, and is a little less than for all railways of the country combined. There has, however, been a relatively rapid increase in the freight density on Southern roads.

The density of passenger traffic is also relatively low in the South, being somewhat below the average for the United States.

Not only is the density of traffic low, but the net revenue per mile of road of the Southern carriers is considerably below the average, amounting only to about $4,500 per annum in normal times.

Small Ton-Mile Revenue and Trainload.—The reasons for this rather poor showing are to be found partly in the traffic and partly in the character of operation. As to the traffic, perhaps the most notable point is the low revenue per ton-mile, which is due to the large proportion of low-grade freight. A comparison of the revenue per ton-mile of the Southern roads with the average for the United States is shown in the following statement.

	United States Average	Southern Territory Average
1917	$.00715	$.00635
1919	.00973	.00873
1921	.01274	.01237

From the operating point of view the notable points are the small average trainload and carload. The average net tons per train are only about 560 as compared with a United States average running from 597 tons in 1917 up to 708 tons in 1920. The average carload of the Southern lines is among the smallest of the various railway groups, and is below the average for the country. The smallness of the average carload is especially noticeable on the more eastern lines—the Southern, the Atlantic Coast Line, and the Seaboard Air Line.

Naturally, having a low revenue per ton-mile and a small trainload, we should expect to find a small freight revenue per train-mile, and it is a fact that the gross earnings of the average Southern freight-train are much below the average for the United States.

Low Earnings Offset by Low Expense and Rapid Movement.—Two things save the day for the Southern roads—their very low operating expenses and their rapid movement of freight. An examination of the Interstate Commerce Commission statistics shows that these roads have the lowest costs per train-mile in the United States, their expenses for all the chief items, including locomotive repairs, wages of engine men and train men, and fuel, being notably small per train-mile.

As to their rapid movement, it may be surprising to some to learn that the number of car-miles per car-day on the Southern roads in 1920 (28.7) was exceeded by only one group, namely, the Pocahontas, and their average train speed was but little below the high record made by the roads of the Central West region. This rapid movement is no doubt due to the large volume of perishable fruits and vegetables which are carried on the Southern roads.

As might be inferred from the fact that the Southern territory as a whole exchanges a relatively heavy low-grade traffic for manufactured products, the Southern railways have another advantage in that a large percentage of the traffic of these roads originates on their own lines. It will be found that the tonnage originating on the road is nearly 65% of the total tonnage in the Southern district.

Summary.—To sum up the situation, we may, therefore, say that the Southern lines make small gross earnings, but as they have small expenses they make a fair showing as to net revenue per ton-mile. The volume of their business, however, is so small that their net earnings per mile of road do not make a favorable showing when compared with those of more highly developed sections. Their operating ratio is rather low. Theirs is a small scale business done at a high profit per unit.

Of course, the relatively low capitalization per mile of line of these roads may enable them to earn a good percentage on their investment even with small net earnings per mile. Their average investment in road and equipment per mile of line is only about $58,000.

The commodity statistics for the Southern roads are as follows:

Commodity Statistics for the Southern District

	% of Aggregate Tonnage Originating on Road	% of Total Freight Tonnage
Products of Agriculture:		
Grain	2.49	2.88
Flour	.53	1.01
Other mill products	.65	.98
Hay	.36	.81
Tobacco	.50	.52
Cotton	.95	1.05
Fruit and vegetables	1.07	2.23
Other products of agriculture	1.55	1.42
Total	8.10	10.90
Animals and Products:		
Livestock	.94	.83
Dressed meats	.16	.20
Other packing-house products	.22	.36
Poultry, game, and fish	.07	.10
Wool	.02	.02
Hides and leather	.06	.08
Other animals and products	.39	.47
Total	1.86	2.06
Products of Mines:		
Anthracite coal	.02	.22
Bituminous coal	45.51	37.76
Coke	1.61	1.50
Ores	2.83	2.44
Stone, sand, and other like articles	6.35	5.61
Other products of mines	1.39	1.47
Total	57.71	49.00
Products of Forests:		
Lumber	9.63	11.20
Other products of forests	4.43	4.10
Total	14.06	15.30
Manufactures:		
Petroleum and other oils	1.45	2.02
Sugar	.37	.79
Naval stores	.21	.23
Iron, pig and bloom	1.13	1.06
Iron and steel rails	.24	.42

	% of Aggregate Tonnage Originating on Road	% of Total Freight Tonnage
Other castings and machinery	.32	.70
Bar and sheet metal	.42	.73
Cement, brick, and lime	2.46	2.75
Agricultural implements	.07	.11
Wagons, carriages, tools, etc.	.11	.34
Wines, liquors, and beers	.10	.12
Household goods and furniture	.20	.25
Other manufactures	3.94	4.70
Total	11.02	14.22
MISCELLANEOUS COMMODITIES not specified above (carload rates)	2.74	3.77
L.C.L. GOODS not distributed above	4.51	4.75
Grand Total	100.00	100.00

CHAPTER X

WESTERN RAILWAYS

THE GRANGER LINES

Chief Granger Roads.—The railways of the Western District fall into three chief groups: the Granger lines of the Northwest, the Transcontinental lines, and the Southwestern lines.

A group of railways (see Fig. 16), mostly in the northwestern section of the country, has long been known as the Granger lines, or the "Grangers," for short. These roads all radiate from Chicago, stretching out in a general westerly direction and to the northwest, and serving a predominantly agricultural region—from which fact they derive their name.

The chief Granger lines and the main points touched are as follows:

1. Chicago and Northwestern Railway Co. (Chicago to Minneapolis; Chicago to Lander, Wyo., via Omaha)
    Chicago, St. Paul, Minneapolis and Omaha Railway Co. (St. Paul-Omaha-Duluth)
2. Chicago, Milwaukee and St. Paul Railway Co. (Chicago to Minneapolis, Omaha, Kansas City, Seattle)
3. Chicago Great Western Railroad Co. (Chicago to St. Joseph, Mo., Omaha, St. Paul)
4. Chicago, Rock Island and Pacific Railway Co. (Chicago to Denver, Santa Rosa, New Mex.; and Dallas, via Omaha and Kansas City)
5. Great Northern Railway Co. (St. Paul to Duluth, Seattle, Portland, Ore., Vancouver)
6. Northern Pacific Railway Co. (St. Paul to Duluth, Portland, Seattle, Vancouver)

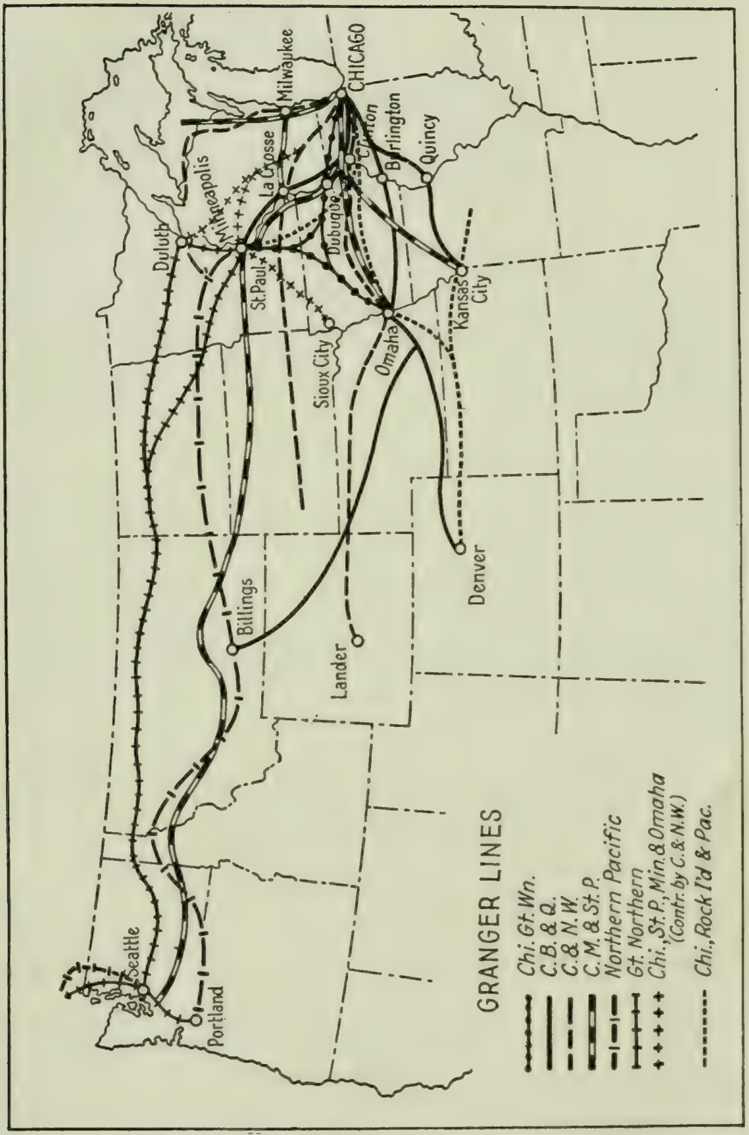

Fig. 16.—Granger Roads

7. Chicago, Burlington and Quincy Railroad Co. (controlled by Great Northern and Northern Pacific jointly), (Chicago to Minneapolis, Billings, Mont., Denver, and St. Louis; Omaha, Kansas City)

Of these roads the Great Northern, the Northern Pacific, and the Chicago, Milwaukee and St. Paul extend through to the Pacific Coast, and hence they serve as "Transcontinental" carriers, as well as being Granger lines. The Granger group contains a considerable number of roads in addition to those mentioned, but most of them are relatively unimportant.

Their Location.—In general, it may be said that with Chicago as their center the Granger lines form a radiating network reaching out toward such secondary centers as Minneapolis, St. Paul, Kansas City, Mo., and Omaha as their immediate objective points. Originally, Chicago was the great primary market for grain and livestock, which were produced in the territory immediately adjacent. Accordingly, the roads mentioned were mostly built to bring such traffic into the western metropolis. Then agriculture became more highly developed to the west and northwest, and the Granger lines were pushed further out and served to connect the new agricultural centers with Chicago. The tendency now is for these roads to reach out to the Pacific, as is illustrated completely by the growth of the Chicago, Milwaukee and St. Paul, and partly by the Chicago and North Western.

The relation of Chicago and St. Louis to the Missouri River points—Sioux City, Omaha, Kansas City, Mo., etc.—is of importance in understanding the situation. Most of the roads terminating in Chicago have no line from St. Louis to those points.[1] St. Louis, as a rival of Chicago, is served to the west by a distinct group of carriers, such as the Missouri Pacific, the St. Louis and San Francisco, and the Missouri, Kansas and Texas. Accordingly, it may be considered as the center from which radiate the southwestern group of roads and thus stands in contrast with Chicago which is the center of the northwestern carriers.[2]

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[1] The Chicago and Alton is an important exception.

In addition to the Missouri River points already referred to, the importance of the "Twin Cities," Minneapolis and St. Paul, is to be kept in mind, for these points are the distributing centers for the whole Northwest and they are a secondary center of concentration—a sort of railway ganglion—for some of the Granger roads.

Economic Factors—Agriculture.—Briefly to mention some of the chief economic characteristics affecting the Granger railways, we must first note that they operate over a relatively level prairie country, which results in a comparatively small investment per mile of line and easy grades and curves. Unfortunately, however, the absence of coal in the further Northwest increases fuel expenses as compared with those roads which are more fortunately situated in this respect. At the same time, this gives rise to a fairly heavy coal traffic at certain seasons of the year.

The dominant factor is the prevalence of agriculture, which is the chief industry through most of the territory served by the Granger lines. Theirs is the great grain belt, while livestock raising and lumbering are also important.

Even in so brief a sketch as this there should be included a word concerning the effect of rivers and lakes upon the rail carriers. While there is in this section little or no water competition for local traffic, the Mississippi River, which flows down the center of the territory from north to south, exerts a slight effect on rates from St. Louis to the Twin Cities; while the Great Lakes afford water competition between Chicago and Minneapolis via Duluth. The influence of water competition, however, is considerably modified by the fact that it is exercised during only a part of the year, and furthermore, that the water routes are either inefficient or have to be supplemented by a railway haul.

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[2] The Atchison, Topeka and Santa Fe forms the chief exception to this generalization as it runs from Chicago to the southwest via St. Louis.

The Mississippi and Missouri rivers interpose barriers which have tended to make certain points at which they are crossed have importance as "gateways." This is notably true of Kansas City, Mo., and Omaha.

Traffic Characteristics.—As to traffic, perhaps the most notable characteristic of the Granger lines still remains the large proportion of agricultural products which they handle. Products of agriculture, chiefly grain, in most cases form 20% or more of their traffic, ranging from 16% up to 35% of the total tonnage. Animal products add something like 7% more.

It follows, naturally, that the traffic is highly seasonal, reaching a maximum during the period of heavy crop movement in the fall, when there is a great demand for box cars to move the grain, which results in frequent car shortages. At other times there is often a surplus of such equipment.

As one might infer, the preponderance of traffic is eastbound in the case of the more typical Granger lines, the mileage of loaded freight-cars eastbound being considerably in excess of that westbound, while empty-car-mileage is greater in the westbound movement. Those roads, however, which, like the Great Northern and Northern Pacific, might be classed as "Transcontinental" carriers, have a relatively heavier westbound traffic and a larger proportion of empty-car-mileage eastbound.

As compared with the average for the United States, and even with the average for the Southern roads, the typical Granger lines have a low freight traffic density. The ton-miles per mile of line for typical Granger carriers ranges from 880,000 up to 1,400,000 as compared with the normal average for the United States of something over 1,600,000. If the Chicago and Northwestern, and the Chicago, Milwaukee and St. Paul be taken as typical in this respect, it may be said that the normal density of freight traffic for a Granger road is only about 1,000,000 ton-miles per mile of line. It may be safely stated that traffic density in the northwestern region is among the lowest in the country.

An operating factor which gives the Granger lines some advantage, however, is the length of their average haul, which, for a typical Granger group, ranges from about 155 miles up to over 290 miles.

Small Net Earnings.—As one considers the operations of the Granger lines, one is particularly struck with the relatively small net earnings per mile of line which these roads show, the figures for a typical group ranging from $2,591 up to $4,663 in 1917, and from $1,187 to $3,576 in 1919. A typical Granger road in a normal year might be expected to show net earnings of about $3,500 per mile of line, as compared with an average for all roads in the United States of about $5,000.

Among the chief reasons for this relatively poor showing is the low traffic density already referred to and the relatively small carloads and trainloads which are found on most of the Granger lines. Such roads as the Great Northern and the Chicago, Burlington and Quincy have average trainloads running well over 600 net tons, but most of the typical Granger lines will only show in the neighborhood of 500 net tons, and this tonnage is distributed among small carloads averaging in the neighborhood of 22 tons against a United States average of over 26 tons.

Of course, one must remember that if the investment per mile of line is small—road and equipment average somewhat less than $65,000,—a small amount of net earnings per mile of line may equal a good return on investment. This appears to be the case with a number of the Granger lines, and such companies as the Chicago, Burlington and Quincy, and the Chicago and North Western have consistently paid good dividends.

THE TRANSCONTINENTAL LINES

Chief Transcontinental Roads.—The group of Transcontinental railways (see Fig. 17) stretch across the western part of the United States from various Mississippi Valley points to the Pacific Coast. In reality they cross only a part of the continent, but, as they were the last link in the chain from the Atlantic to the Pacific, and as they have owed their chief significance to their position in bridging the gap between the Missouri River and the Pacific Coast, they have been given the name which they bear. This group of railways includes the following:

1. Union Pacific Railroad Co. (Council Bluffs, Iowa, to Ogden; Kansas City to Denver)
    - Oregon Short Line Railroad Co. (Granger, Wyo., and Ogden, to Huntington, Ore.)
    - Oregon-Washington Railroad and Navigation Co. (Huntington, Ore., to Portland and Spokane)
    - Los Angeles and Salt Lake Railroad Co. (Salt Lake City to Los Angeles)
2. Southern Pacific Co.
    - Southern Pacific Railroad Co. (New Orleans to San Francisco and Portland, via Galveston and Los Angeles)
    - Central Pacific Railway Co. (Ogden to San Francisco)
3. Western Pacific Railroad Co. (Salt Lake City to San Francisco)
4. Atchison, Topeka and Santa Fe Railway Co. (Chicago to Los Angeles and San Francisco, via Kansas City)
    - Gulf, Colorado and Santa Fe Railway Co. (Galveston to Purcell, Okla.—See Granger Lines)
    - California, Arizona and Santa Fe Railway Co. (Needles, Cal., to Oakland, San Francisco Bay)

5. Northern Pacific Railway Co. (see Granger lines)
6. Great Northern Railway Co. (see Granger lines)
7. Chicago, Milwaukee and St. Paul Railway Co. (see Granger lines)

Obviously, these great Western Trunk Lines may be divided into three subgroups: a northern group embracing the Northern Pacific, Great Northern, and Chicago, Milwaukee and St. Paul; a central group embracing the Union Pacific and

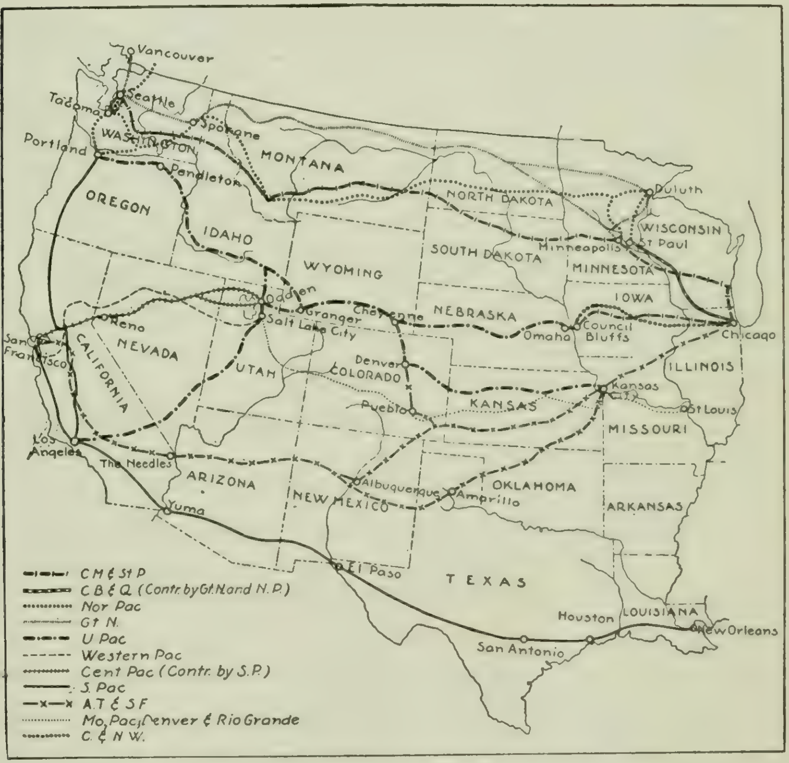

Fig. 17.—Chief Transcontinental Lines and Chicago Connections

the Central Pacific; a southern group, composed of the Atchison, Topeka and Santa Fe, and the Southern Pacific.

Interwoven at Eastern and Western Termini.—At their eastern termini these roads are curiously interwoven. The Chicago, Milwaukee and St. Paul, and the Atchison, Topeka and Santa Fe both terminate at Chicago, thus placing the northern and southern routes in direct competition at that important point, a competition by which the middlewestern metropolis benefits materially. The Great Northern and Northern Pacific, too, gain access to Chicago by way of the Chicago, Burlington and Quincy which they jointly control. At the same time, the Chicago, Milwaukee and St. Paul passes through Minneapolis and St. Paul, which points constitute the eastern termini of the Great Northern and Northern Pacific lines proper. The Union Pacific ends at Council Bluffs on the Missouri River, but connects there with various lines, its closest affiliation appearing to be with the Chicago and North Western. The Southern Pacific, true to its name, terminates in New Orleans, but offers keen competition to New York by means of a steamship line which it operates, the Morgan Line.

This concentration on Chicago is a striking characteristic. The advantages of Chicago's location are well known, but such a heavy concentration of traffic on that point limits elasticity in routing between east and west and tends to congestion.

On the Pacific Coast, ports are few. The northern group serve the northern coast ports of Seattle, Tacoma, and Portland. The Union Pacific terminates in Ogden and Salt Lake City, but connects there with the Central Pacific for San Francisco. Both the southern Transcontinental roads reach San Francisco by the southern route, but both also have as an intermediate Pacific Coast port, Los Angeles.

While this statement covers the main scheme of things on the Pacific Coast, it is by no means complete, and the competitive situation is much more complex than it would indicate. In the first place, the Union Pacific is really in the form of a great trident, as it controls branches which extend from the neighborhood of Great Salt Lake to Portland and to Los Angeles. In the second place, the Southern Pacific does not stop at San Francisco and its line extends up the coast to Portland. It is thus apparent that three of the main Transcontinental systems—the Union Pacific, the Southern Pacific, and the Northern Pacific—come together at Portland, and that the Southern Pacific serves both the Northern Pacific and the California coast ports.

The Inter-Mountain Points.—Between 250 and 300 miles inland from the coast lie a number of towns which are known as the "inter-mountain points." They do not have the advantage of water competition which is enjoyed by the coast towns, and consequently have a severe struggle to retain any trading area between themselves and the coast. These cities include Spokane, Wash., on the northern route; Pendleton, Ore., on the northern branch of the Union Pacific; Reno, Nev., on the Central Pacific; and Prescott and Phoenix, Ariz., on the Santa Fe. These cities, as we shall see, constitute a serious problem in the rate structure of the Transcontinental roads, as they naturally insist that their westbound rates should be as low as or lower than those to the coast ports, in spite of the fact that water competition requires especially low rates to the latter.

Panama Canal Competition—Canadian Roads.—This suggests what is probably the most serious problem of the Transcontinental lines, namely, the Panama Canal. In the days when it took two months to ship goods by water around Cape Horn, the rail routes across the continent had little to fear from water competition, and it was easy enough to make satisfactory rate adjustments. With the opening of the Panama Canal in 1914 there was established a new water route with a direct through sailing distance between New York and San Francisco of approximately 5,000 miles and without a transfer en route. The canal route cuts the time required by water in shipments from coast to coast down to between 18 and 20 days, which is probably as good as or better than the average time required for the movement by rail. Consequently, water competition has been very severe.

Another phase of the competitive situation in this territory is that offered by the Canadian roads, the Canadian Pacific and the Canadian Northern, which extend along the northern boundary of the United States from Montreal and Quebec to Vancouver. As these carriers are subject to requirements and rate regulations different from those in the United States, they constitute a distinct problem for the Transcontinental lines.

Traffic and Operating Characteristics.—The Transcontinental roads all cross a wide stretch of territory which is but sparsely settled and has slight industrial development; for west of the 100th meridian, as every one knows, the rainfall is so scant that little agriculture is possible except by means of irrigation. The Transcontinental lines also have to contend with the great barrier of the Rocky Mountains, which is crossed only at enormous expense and with steep grades and numerous curves. From these things it follows that they have an unusually great mileage in proportion to their traffic, and their operating problems are widely different from those of the eastern roads.

The Transcontinental lines show an unusually large number of locomotive miles in proportion to the number of trains hauled, which is chiefly due to the mountainous territory which they traverse. Such roads as the Oregon-Washington Railroad and Navigation Co. and the Southern Pacific show an average ratio of freight-train-miles to locomotive miles of less than .80, and most of the other Transcontinental lines have ratios under .90.

Commodities Hauled.—Agricultural products are naturally an important element in the traffic of the Transcontinental lines, running from 16% of the total in the case of the Santa Fe, up to 30% in the case of the Union Pacific. Within the agricultural group, grain and fruit and vegetables are the most important items, with the two latter items most decidedly predominant on the Union Pacific and Southern Pacific lines, where they run in the neighborhood of 11% of the total traffic. Live-stock also furnishes a large volume of traffic on these roads, especially on the Santa Fe. Lumber from the western forests is one of the most important items, particularly on the northern route. Manufactured products form about 20% of the traffic of the central and southern lines, but do not make so large a percentage of the traffic over the Northern Pacific.

The eastbound carloads of the Union Pacific in 1920, as measured by interchange movement at the eastern terminus, are shown in the following table:

PERISHABLES	Carloads	CHIEF NON-PERISHABLES	Carloads
Apples and other fresh fruit	32,909	Lumber, etc.	35,891
Citrus fruits	9,176	Canned goods	5,098
Vegetables	4,210	Sugar, etc.	4,148
Eggs and poultry	218	Coal	2,472
		Wool, etc.	1,625

The foregoing figures emphasize the large proportion of perishable products which move over the Transcontinental lines, and suggest the great number of refrigerator cars required for their eastbound business.

Westbound there is a heavy carload movement of cotton (largely for export), steel products, and automobiles. The bulk of the tonnage in this direction is composed of manufactures and coal.

The foregoing facts might be inferred from the nature of the territory served. Both the Pacific Coast and the mountainous territory to the east produce great quantities of citrus and other fruits and melons, potatoes, and other vegetables. Beet sugar and rice are also large crops, while cattle-raising in the plains states is a leading industry. All these products, together with canned foods, move eastward to the markets chiefly in the territory east of the Mississippi River and north of the Ohio. The Pacific Coast forests in northern California, Oregon, and Washington furnish a huge tonnage of lumber, which is also shipped east. Such states as Montana on the north and Arizona on the south are large producers of copper and other non-ferrous metals, which are smelted locally and transported in the semifinished shape to eastern points for refining.

Direction of Traffic—Lack of Balance.—The prevailing movement of traffic is now eastbound. Back in 1907, when the Interstate Commerce Commission still published figures indicating the loaded and empty-car-mileage moving in different directions, it was shown that the loaded-car-mileage in the entire Rocky Mountain–Pacific Coast territory was 332,000,000 westbound, compared with only 284,000,000 eastbound. In accord with this fact, the empty-car-mileage eastbound was greatly in excess of that westbound. But even at that time, the eastbound car-mileage was predominant in the northern half of the territory west of the Mississippi, and at present the eastbound movement is the greater. In 1920 (March to November) the eastbound and westbound tonnages through Portland, Ogden, and El Paso gateways were as follows:

	Westbound (tons)	Eastbound (tons)
Via Portland	571,172	749,557
" Ogden	1,076,395	1,616,861
" El Paso	802,226	1,046,733
Total	2,449,793	3,413,151

These figures not only indicate that in 1920 the Transcontinental eastbound tonnage was 58% of the total, but also that the central gateway at Ogden was the channel for the largest stream of traffic.

In this territory, as in most other regions of the United States, over one-half of the loaded-car-mileage is eastbound—about 67%.

Partly because of the predominance of eastbound tonnage, one of the chief problems of the Transcontinental lines is to secure westbound traffic to fill empty cars in that direction. This problem, however, would exist even if the eastbound *tonnage* were considerably less, for it is partly to be explained by the bulky character of the eastbound traffic and by the large movement of fruits and vegetables in refrigerator cars eastbound. These lines own about 50,000 refrigerator cars for handling the perishable products produced in their territories, and freight suitable for loading in these cars on the back haul is very desirable. The eastbound lumber traffic, too, means a large movement of empty box cars to the west.

Traffic Not Dense—but Rapid Long-Haul Movement.—The salient traffic and operating facts relating to the Transcontinental roads may be briefly summed up as follows. The density of freight, while it is greater than that of the typical Granger lines and other western carriers, is under the average for the United States, with the single exception of the Union Pacific. On the average, the Transcontinental lines have a density of about 1,300,000 ton-miles per mile of line, while the Union Pacific normally has about 2,000,000. This relatively low density of freight traffic is associated with rather small trainloads and carloads, although here again the Transcontinental lines make a better showing than the typical Granger lines, especially in the case of the Northern Pacific, which has a large volume of coal traffic. The average trainload of the Union Pacific was 499 tons in 1917 and 558 tons in 1919. In both years its average carload was 20 tons.

But this lack of density in traffic is partly made up by other conditions, which are more conducive to good net earnings.

1. The Transcontinental lines have an extraordinarily long average haul, amounting to well over 300 miles. In 1919 the Union Pacific had an average haul per ton of freight of 471 miles, while the average for the United States was only 178 miles.
2. The movement of freight over the Transcontinental lines is very rapid. The number of car-miles per car-day in the central western region has recently been second only to the maximum found on the Pocahontas roads, and was 33.8 in 1920. As a result of the rapid movement of freight we find a very large tonnage is handled per car-day, even though the average carload is small. In other words, the cars move so rapidly or continuously that in spite of the small number of tons per car the number of ton-miles per car-day is high.
3. The Transcontinental lines show a rather high average revenue per ton-mile, the figure being well over the average for the United States.

To sum up, though their traffic is not dense these roads have a rapid long-haul movement at high rates.

Good Net Earnings.—The net result of these factors is that the Transcontinental lines show rather high net earnings per mile of line. It may fairly be said that a typical figure for the group is approximately $6,000 per mile of line, which is well over the average for the United States. The Union Pacific makes much the strongest showing, in 1917 its net earnings per mile of line being $8,571, and in 1919, $10,206. The average investment in road and equipment per mile is between $66,000 and $70,000.

It is a notable fact that the net earnings per train-mile of the Transcontinental lines are high, owing to the same favorable conditions which have already been mentioned.

SOUTHWESTERN LINES

Chief Roads in Group.—In much the same way that the Granger lines radiate from Chicago, a group of southwestern railways (see Fig. 18) extends out from St. Louis and Kansas City in the general direction of the Gulf of Mexico. These roads have a characteristic traffic and may be considered on that basis as constituting a distinct group. The chief Southwestern roads are the following:

1. Missouri, Kansas and Texas Railway Co. (St. Louis to Houston and San Antonio, Tex.)
2. St. Louis–San Francisco Railway Co. (St. Louis to Kansas City, Mo. points in Oklahoma, Texas, and Arkansas, and to Birmingham, Ala., via Memphis)
3. St. Louis Southwestern Railway Co. (St. Louis to Dallas and Ft. Worth; Memphis)
4. Gulf, Colorado and Santa Fe Railway Co. (controlled by Atchison, Topeka and Santa Fe, see page 153)
5. Missouri Pacific Railroad Co. (St. Louis to Pueblo, Colo., Texarkana, Ark., Lake Charles, La., etc.)
6. International and Great Northern Railway Co. (Houston and Laredo, Tex., to Fort Worth, Tex.)
7. Texas and Pacific Railway Co. (New Orleans to El Paso, via Dallas)
8. Kansas City Southern Railway (Kansas City, Mo. to Port Arthur, Tex.)

A glance at the map will show that these various lines strike southwest from St. Louis and Kansas City, Missouri, and stretch across the states of Arkansas, Oklahoma, and Texas to terminate at Houston and Galveston on the Gulf or at Ft. Worth and Dallas in interior Texas. The Texas and Pacific, however, runs in a general westerly direction across Texas from New Orleans to the Rio Grande, and a number of smaller roads also run east and west.

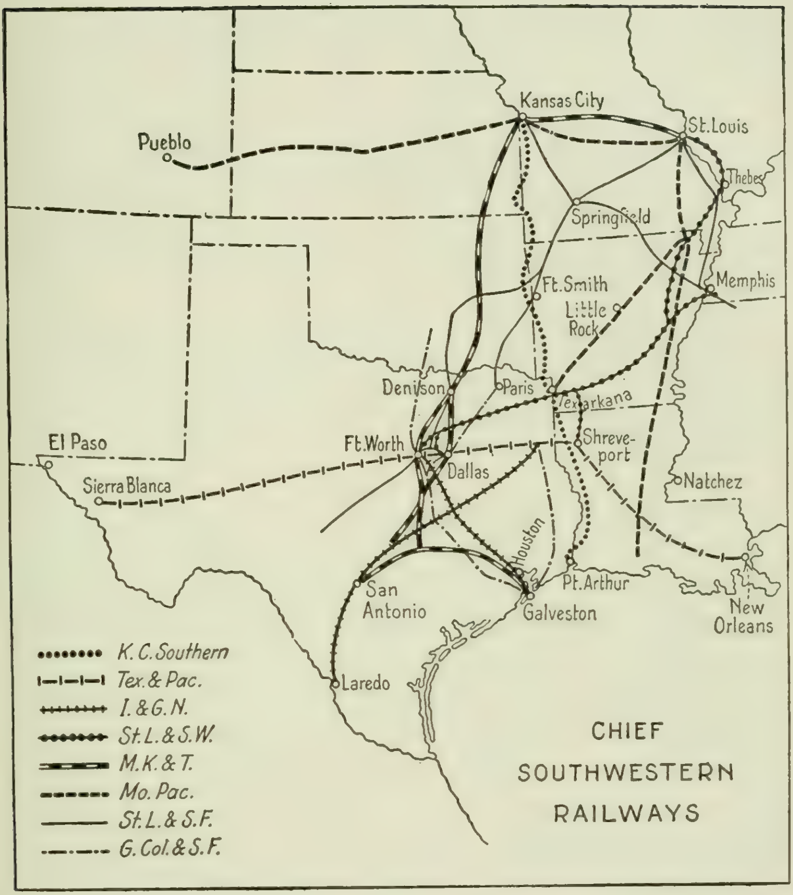

Fig. 18.—Chief Southwestern Railways

Relation with Other Roads.—Most of the southwestern lines are cut by the Southern Pacific, or Santa Fe, and have in the past participated to some extent in transcontinental traffic. They do not, however, afford a direct route for such traffic, and there seems to be no probability that if left to themselves they will become parts of transcontinental systems as is likely to be the case with the Granger lines. On the other hand, with the opening of the Panama Canal they have gained a greater opportunity for export and import traffic.

Character of Traffic.—These roads, like the Granger lines, are predominantly agricultural carriers, hauling large quantities of grain, cotton, lumber, and livestock. Petroleum and coal are also considerable items. There is a growing volume of export traffic, both grain and cotton, moving out of Galveston.

Naturally, the traffic varies according to seasonal conditions, and is also subject to great changes from year to year, caused by the success or failure of crops in a country where droughts are not uncommon.

Low Net Earnings.—Most of the southwestern carriers have not been very profitable and show very low net earnings per mile of line. This may be explained largely by their very low traffic density. The roads of the southwestern region show the lowest number of ton-miles per mile of line of any section of the country. Their trainloads are the smallest to be found outside of the New England section, and the average carload is also very small. It may be said that they are only able to operate with any success at all by reason of their low expense per train-mile, which is similar to that of the roads in the Southeast. This condition is due to reckless promotion and overconstruction. There are too many lines in proportion to the traffic available at present.

Commodity Statistics for the West.—Commodity data are not available for each of the three western groups separately, but some idea of the kind of traffic throughout the whole section may be secured from the following figures. Data for the individual roads are to be found in *Statistics of Railways in the United States.*

COMMODITY STATISTICS FOR THE WESTERN DISTRICT

	% of Aggregate Tonnage Originating on Road	% of Total Freight Tonnage
PRODUCTS OF AGRICULTURE:		
Grain	9.5	8.5
Flour	2.1	1.96
Other mill products	1.4	1.3
Hay	1.1	1.04
Tobacco	.01	.04
Cotton	.5	.6
Fruit and vegetables	3.1	4.5
Other products of agriculture	1.2	1.3
Total	18.9	19.3
ANIMALS AND PRODUCTS:		
Livestock	3.8	3.2
Dressed meats	.4	.4
Other packing-house products	.4	.3
Poultry, game, and fish	.2	.2
Wool	.04	.06
Hides and leather	.1	.1
Other animals and products	.5	.5
Total	5.4	4.8
PRODUCTS OF MINES:		
Anthracite coal	.6	.6
Bituminous coal	13.5	14.2
Coke	.5	.7
Ores	20.2	14.1
Stone, sand, and other like articles	6.9	5.4
Other products of mines	3.0	3.9
Total	44.7	38.9
PRODUCTS OF FORESTS:		
Lumber	10.2	11.7
Other products of forests	3.0	2.6
Total	13.2	14.3
MANUFACTURES:		
Petroleum and other oils	3.3	4.5
Sugar	.6	.9
Naval stores	.03	.04
Iron, pig and bloom	.3	.4
Iron and steel rails	.1	.3
Other castings and machinery	.6	1.6
Bar and sheet metal	.4	1.2
Cement, brick, and lime	3.0	3.0
Agricultural implements	.3	.3
Wagons, carriages, tools, etc.	.2	.5
Wines, liquors, and beers	.2	.3
Household goods and furniture	.2	.3
Other manufactures	2.1	3.3
Total	11.4	16.6
MISCELLANEOUS COMMODITIES not specified above (carload rates)	1.8	1.7
L.C.L. GOODS not distributed above	4.6	4.4
Grand Total	100.0	100.0

Part III—Principles of Railway Rates

CHAPTER XI

ECONOMIC PECULIARITIES OF THE RAILWAY BUSINESS

The Economics of Rate Determination—Value.—The principles of railway rate-making—sometimes called theory of railway rates—deal with the *value of the transportation service.* The inquiry may concern the question of how railway rates have actually been determined in the past when subject to no close regulation, or how railway rates should be determined in the future under close regulation. In any case, however, it is desirable first to pause and recall the teachings of economics concerning the nature of value and its determination.

"Value," as ordinarily considered in economic science, is the ratio in which goods and services exchange for one another, and a commodity, the ordinary unit of which exchanges in the market for two ordinary units of a second commodity, is twice as valuable as the latter. The value of the transportation service, accordingly, is the ratio in which it exchanges for other commodities or services. Ordinarily some standard is adopted as a common denominator for measuring and expressing values. Such a common denominator is money, and our dollar represents the standard of measurement. Values, when expressed in terms of dollars or other monetary units, are generally called "prices."

The railway rate expressed in terms of cents per hundred pounds is, therefore, the price of the transportation service.

Like all economic values, the value of transportation expresses the relative importance of the service in comparison with other valuable things. This relative importance in most cases depends ultimately upon the relative cost of producing the things which are compared and exchanged, and upon the relative intensity of the demands therefor. The demand, in its turn, depends upon the intensity of wants, and is effective in the degree to which wants are supported by purchasing power on the part of those who feel the wants. In the case of railway freight transportation the demand is secondary, being derived from the desire to have commodities at a given point to which they have to be hauled. The commodity may be wanted for itself, but the transportation is wanted only as a means of obtaining the commodity.

Rates Equilibrate Demand and Supply.—Another way of looking at value is to consider it as having a function—the function of equilibrating demand and supply. Thus the value of the transportation service must be such as to insure that the supply of transportation is adequate to meet the demand at a point where the greatest possible utilization of transportation facilities will exist. This point will vary with industrial conditions, such as affect railway operating expenses and the profits made by shippers in transporting goods from place to place; but in general it may be said that the railway rate is too low as long as the quantity of transportation service demanded is greater than can be profitably supplied at that rate, and *vice versa*. If, for example, between two cities the railway rate is one dollar per hundred pounds, and there is so much profit to shippers at that rate that they demand more facilities in the way of locomotives, cars, tracks, and labor than the railways can supply between those points without loss, then the rate must be raised in order to enable the railway to increase the supply. The raising of the rate, on the other hand, has a tendency to reduce the shippers' profit and thus to eliminate a part of the demand. This double process is one of equilibration between demand and supply, and it is effected through changes in value or price. As a result of this process the maximum amount of exchanges of goods or of transportation is assured to the public.

General Rate Level vs. Particular Rates.—There are two ways of looking at the value of the transportation service:

1. The entire freight service of a railway or of all railways may be considered as a whole, and railway rates be thought of as a general level of payment for the combined service performed. This is the point of view taken when we are considering general rate reductions or advances, and the question is one of balancing the total revenues of the carriers against the total operating expenses and comparing the balance with their total investment.

2. More frequently the question is one of determining the particular rate to be charged for transporting some particular commodity between two particular points. In such cases we do not necessarily deal with the total expenses and revenues although these are, of course, affected. Particular rates are in a way more difficult to determine than the general rate level, as it is almost impossible to determine the cost of transporting any particular commodity. Consequently, the demand of the shipper is apt to play a larger part in particular cases. This is a pretty intangible factor, and rates based merely upon demand easily become discriminatory.

From what has been said thus far it is apparent that in the last analysis the problem of determining the value of the transportation service—which is the rate problem—is one of knowing and weighing the factors upon which depend demand for and supply of such service. It is, therefore, desirable to lay a foundation for the conclusions to be reached by analyzing those factors.

Demand Factors—"Marginal Demand Price."—Like the demand for all economic quantities, the demand for transportation is subject to the law of diminishing utility. As the supply of transportation—locomotives, cars, and terminal facilities—increases, the *intensity* of the want for it tends to decrease. Utility (wants) may increase as fast as transportation facilities, but always the tendency to diminish is there, and if the supply of transportation is continuously increased, there will come a time when any unit of transportation service, say the ton-mile, will find a less intense want among shippers. Such is the law.

At any given time there is a certain "marginal demand price" for a unit of transportation service. By this is meant that there is a certain maximum rate which is the most that will be paid by the shipper who has the least demand for such a unit. As already implied, each shipper has a certain want for railway service and a certain ability to pay, and these are the things which determine his individual "marginal demand price." The intensity of the shipper's want is what economists call "marginal utility." Shippers whose want or whose purchasing power is less than the existing railway rate, do not ship, and exercise only an indirect effect upon the rate level. They are "supra-marginal"—above the margin.

Elasticity of Demand.—The "elasticity" of demand is a very important factor. By this is meant the readiness with which prices or rates change when the supply is altered. If prices fall quickly when the supply of a commodity is increased, we say that the demand is inelastic, for it breaks readily. When a commodity or service has a wide variety of uses, or when there are many unfilled wants which come into play as the supply is increased, the price or rate tends to be maintained and we say the demand is elastic. This is the case with railway transportation in general, although the demand for the transportation of some particular commodity may be inelastic just as the consumer demand for that commodity may be.

This last statement suggests a point already mentioned, namely, that the demand for railway transportation ultimately is derived from the demand for the commodities which are transported. The demand for the transportation of salt or any widely produced commodity which meets wants of small intensity is not so keen as the demand for transportation of silk or fruit which have, for one reason or another, a higher marginal utility.

Supply Factors—Diminishing Cost.—Like all things which man can produce, railway transportation is supplied only by incurring certain costs of production, and is subject to the laws which govern increase of cost. Some commodities, such as agricultural products, are so closely dependent upon limited land area that the expense of producing them tends to increase rapidly as production is increased, and these may be thought of as obeying a law of diminishing returns or increasing cost. Others which are generally more dependent upon the use of large amounts of capital show decreased unit costs as the supply is increased, and are said to obey the law of increasing returns or diminishing costs. Such is the case with railway transportation. Within wide limits, the greater the volume of transportation the less the cost per ton-mile. As will be pointed out later, this does not hold true indefinitely, but it is apt to be true for so large a part of the time that, with certain qualifications, it is helpful to consider railways as being subject to unit costs which tend to diminish as traffic increases.

"Fixed Expense."—The chief factor in causing a condition of increasing returns or diminishing cost is the existence of a large proportion of "fixed expense." This condition is notably true of railways, for, as we shall see, approximately two-thirds of a railway's expenditures ordinarily remain practically constant regardless of the volume of business. This is apt to be true of any business which requires large initial investment in fixed capital, and is made the more true in the case of railways because so large a part of their investment, such as roadbed and track, is subject to depreciation without regard to volume of traffic. This condition always tends to make an industry strive to increase its volume of business without much regard to unit operating expenses.

One can start in the milk business for a few hundred dollars, and in the wholesale grocery business for a few thousand dollars. Such businesses require but small fixed capital in the shape of buildings and equipment. A railway, however, may easily cost more than $50,000 per mile, to say nothing of the great expense of terminals and equipment. The investment in the railways of the country is over $18,000,000,000. This means an enormous "fixed charge," which does not vary in relation to the volume of traffic—which, indeed, would largely go on if there were no traffic at all. The following table shows the chief items of a railway's expense and their proportion to the total, the figures being an average for the United States for 1917.

Chief Expense Items—Percentages of Total Railway Expense

Items of Expense	Percentages of Total Expense		Percentages of the Total of Expense and Tax Accruals, and Deductions from Income
MAINTENANCE OF WAY AND STRUCTURES:			
Total	15.6%		11.8%
Roadway maintenance		1.8%	
Bridges, trestles, and culverts		1.1	
Ties		2.1	
Track laying and surfacing		4.4	
Superintendence		.9	
MAINTENANCE OF EQUIPMENT:			
Total	24.2%		18.4%
Locomotives		9.6%	
Freight-cars		9.8	
Passenger-cars		1.8	

Items of Expense	Percentages of Total Expense	Percentages of the Total of Expense and Tax Accruals, and Deductions from Income
TRANSPORTATION:		
Total	53.5%	40.5%
Fuel for locomotives	13.8	
Station employees	6.9	
Engine men and engine-house expenses	9.9	
Train men	6.1	
MISCELLANEOUS OPERATION	1.0%	
TRAFFIC	2.3%	2.0%
GENERAL EXPENSES	3.4%	2.5%
FIXED CHARGES DEDUCTED FROM INCOME		24.3%

Maintenance of Way and Equipment.—Taking up the items in the foregoing table one by one, we find that the maintenance of way and structures expense is, in large part, dependent upon weather and natural decay. Ties rot and road ballast washes or blows away. Iron and steel rust. These things are largely independent of traffic. So is the cost of removing snow, ice, and sand, and the painting and repair of stations, signs, fences, and telegraph lines. The largest single item, however, track laying and surfacing, is most notably independent of traffic. In the well-known Wisconsin "2-cent fare decision" in 1907 it was found that only one-tenth of the expense of maintaining roadway, tracks, and bridges varies with the traffic, and but one-third of the tie maintenance; while the total expense of rails was assigned to wear and tear. The best estimates have been to the effect that about one-third of the total expense for maintenance of way and structures varies with the traffic, while two-thirds is fixed or independent thereof. As this item is about 15.6% of the total, it is apparent that 10.4% of the total is fixed on this account.

The expense of mantaining equipment is more variable, especially in the case of freight equipment. Every effort is made by the railways to use equipment to its full capacity, and it can be adjusted to demand much more readily than is the case with way and structures. It is ordinarily estimated that about 50% of this item is variable, and, as it constitutes 24.2% of the total operating expense, we may add another 12.1% to the fixed expense.

Transportation Expense.—Over half of a railway's operating expenses are incurred for "transportation," and it may be estimated that approximately 50% of these transportation expenses are constant. The largest single item is fuel for locomotives, about one-third of which is independent of the volume of traffic, being more closely connected with the mere length of time that the locomotive is under steam. The next largest items are those made by the wages of the engine men, train men, and station employees. As none of these employees are paid on the basis of the volume of the traffic which they handle, it is apparent that their wages can bear no close relation to that volume. In fact, to a considerable extent, wages are paid on the basis of time and do not even vary with relation to train-miles. These facts explain why it is estimated that something like 27% of a railway's total operating expenses are constant.

Traffic and General Expense.—The remaining items of the expenses are practically constant, or fixed with regard to the volume of traffic. In "traffic expenses" the variable element is negligible, and in any case the total amount is relatively small. General expenses and fixed charges being incurred to pay for the services of general officers and interest, rentals, and taxes, naturally are much the same year in and year out, regardless of the tonnage hauled.

Percentage of Total Variable and Constant Expenses.—If the reader has followed the foregoing analysis, it will now be apparent that a little over two-thirds of a railway's total expenses (including tax accruals and all fixed charges or deductions from income) are relatively constant, or "fixed," with reference to the volume of traffic. On the basis of the income account of 1917 the following percentages may be considered as fairly representative:

ANALYSIS OF VARIABLE AND CONSTANT EXPENSES

	Percentage Variable	Percentage Constant
Maintenance of way	3.9	7.9
Maintenance of equipment	9.2	9.2
Transportation	20.2	20.2
Traffic	—	2.0
General	—	2.5
Fixed charges	—	24.3
Total	33.3	66.1

It must not be thought that the constant or fixed expenses have absolutely no relation to volume of traffic, for it is quite obvious that this is only true within certain limits. When a railway's traffic develops to such a point that it must increase its investment in track and rolling stock, it must also increase its fixed charges in the way of interest and taxes. The investment required may be so large as even to prevent the payment of dividends for a time. But after the new level of investment has been established, the capital charges again remain constant regardless of the development of traffic. A more general statement of the principle involved, therefore, would be that *under any given conditions as to size of plant and administrative organization, approximately two-thirds of a railway's expenses remain constant.*

Why Competition Tends to Become "Cutthroat."—It follows from this situation that railways are virtually compelled to take traffic which does not contribute its full share of the revenue required to cover total expense. Under free competition railways will accept traffic which merely pays enough to cover the direct expense occasioned by the movement of that particular traffic, such as the cost of handling it at terminals.

A classical illustration of this situation is that given by Hadley in his "Railroad Transportation." A railway running from A to B is assumed to be carrying 100,000 tons between those points at 25 cents per ton, which brings in gross revenue of $25,000. Transportation expenses are $10,000; repairs and general expense $5,000; and interest on investment $10,000. Thus the operating expenses are $15,000. Now comes a new road which is built parallel to the first one and hauls traffic from A to B at 20 cents per ton. The first carrier must meet the reduced rate and consequently the gross revenue falls from $25,000 to $20,000. The expense being assumed to remain constant at $15,000, it is apparent that there is a still smaller return, $5,000, left as interest. Further competition now cuts the rate to 15 cents per ton and the gross revenue of $15,000 merely pays operating expenses, with nothing left over for return to capital. A further rate cut to 11 cents follows, with the result that the gross revenue falls to $11,000, which is only sufficient to pay the transportation expenses proper and contribute $1,000 toward repairs and general expenses.

The point to be made is that while in a sense both of the competing carriers are losing money, the contribution of $1,000 towards repairs and general expenses is better than nothing. As long as traffic contributes something above the direct out-of-pocket expenses required to handle it, competing carriers will desire it. As Hadley puts it, "If you take at 11 cents freight that costs you 25 cents to handle you lose 14 cents on every ton you carry. If you refuse to take it at that rate, you lose 15 cents on every ton you do not carry." That is to say, your fixed charges being assumed to amount to 15 cents per ton, you lose that amount on every ton you do not take; and if the freight pays 11 cents towards those fixed charges, every ton of it which you secure cuts down your loss to only 4 cents per ton.

"Joint Expense."—There is a second vital factor affecting railway rates on the supply side, and that is "joint cost." An unusually large part of railway expenses are "joint," and this fact profoundly affects railway competition and railway rates.

Costs are said to be joint when they are incurred for two or more products or services which (1) have different markets, and (2) are necessarily produced together.[1] Cotton and cottonseed are necessarily produced together and at the same time have different economic markets, one being demanded for manufacture of textiles while the other is used for food and feed. Consequently, the cost of growing cotton is an excellent illustration of joint cost. It is practically impossible to say how much of the expenses of a cotton plantation are chargeable to the lint and how much to the seed.

In much the same way, a railway's expenses are joint, as between its passenger and freight service and as between various items of freight. As a practical matter most railways have to produce passenger transportation and freight transportation at the same time, and the utilities afforded by the two branches of service are widely different. Also, railways have much traffic which is taken to fill their cars on a "back haul." They move trainloads of freight from some point of origin where traffic is abundant, and the cars in those trains have to be returned to secure other loads. If the point of destination is not one which supplies much traffic, the back haul must be largely empty and the traffic which they secure on the back haul has special importance. Clearly, the expense of moving the train from the point of origin to its destination and back again is, in a very real sense, a cost which may be regarded as being incurred jointly for the prevailing traffic and the back-haul traffic. The two are necessarily produced together, and the transportation services are sold in different markets. Several important instances of the back-haul problem have been given on preceding pages, such as those of the Pocahontas roads and the Gulf carriers.[2]

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[1] See Haney, "Joint Costs with Especial Regard to Railways," *Quarterly Journal of Economics,* Feb. 1916.

While it is true that in the case of railway traffic the production of each of the joint products is, to a large extent, variable and is not physically fixed as is the proportion of cotton seed or lint, this only makes a difference in degree, and it is economically necessary that an important quantity of passenger traffic be handled along with freight traffic, or that the back-haul traffic be developed as much as possible.

Competition and Rates Affected by Joint Costs.—The point of this discussion of joint costs as affecting railways is that there can be no direct relation between total railway expense and the volume of any single kind or class of railway traffic. Being necessarily produced together, a reduction in the volume of any one kind of traffic does not proportionately reduce expenses. Indeed, to this extent, the matter is but a phase of the fixed expense idea. There are certain results peculiar to joint expense, however, which are of great importance. For one thing, it is the existence of a large amount of joint expense which makes railway competition so different from competition in most industries. Joint costs are obviously indeterminate and cannot be specifically charged to any one of the joint products. Accordingly, there are no known cost limits, and under competition rates can be arbitrarily fixed. Competition can never work satisfactorily where costs cannot be accurately determined.

Moreover, joint expenses open the door to discrimination. When the public knows approximately what it costs to perform each item of service, it can insist that each service shall be performed with some uniform relation to the expense involved.

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[2] See pages 130 and 142.

Lacking such knowledge, however, the public must, to a large extent, accept the arbitrary charges named by the carriers. Indeed, the carriers themselves, not knowing the costs of their different services, might, with the best of intentions, name rates which would be discriminatory on a cost basis.

Proportion of Railway Expenses which Are Joint.— Such being the importance of joint costs, let us attempt to get some idea of the proportion of railway expenses which are joint. The chief data are to be found in the reports of the Interstate Commerce Commission, and there follows a table which shows the percentage of railway expenses which are assignable to the passenger and the freight services as estimated by the Commission in its report for 1917.

PERCENTAGES OF RAILWAY OPERATING EXPENSES ASSIGNABLE TO FREIGHT AND PASSENGER SERVICES

	Per Cent of Total	Per Cent Assignable to Freight Service	Per Cent Assignable to Passenger Service	Total Per Cent Assignable
Total operating expense	100%	48.4%	15.7%	64.1%
Maintenance of way and structures	15.6	9.3	2.8	12.1
Maintenance of equipment	24.2	60.8	15.9	76.7
Transportation (rail)	53.2	56.9	18.0	74.9
Traffic	2.3	51.5	33.9	85.4
General	3.4	23.9	6.4	30.3

The foregoing table shows that approximately 64% of a railway's operating expenses are assignable to the freight and passenger service, which leaves approximately 36% clearly joint and unassignable. This statement of the case, however, only tells part of the story, for after the expenses have been assigned to the freight service, there arises the problem of assigning them to the various commodities which together make up the freight traffic. Much the same may be said of the expenses within the passenger service. Consequently, we must conclude that a much larger percentage than 36% is really joint.

It has been estimated that approximately 75% of all a railway's expenses, in one sense or another, come under the head of joint expenses. In the first place, although the Interstate Commerce Commission has undertaken to allocate general expenses as between freight and passenger service, the fact remains that any allocation of the item is more or less arbitrary, and general expenses are essentially joint. Consequently, we must add approximately 3.4% to the 36% of expenses that cannot be assigned either to passenger or to freight service, which brings the total up to nearly 40%. In the second place, the allocation of expenses for maintenance of way and structures must clearly be estimated on some such basis as the relative number of miles made by freight trains and passenger trains, and cannot be directly assigned to either branch of the service. Consequently, a large part of that item is also really joint, which adds at least 10% of the total operating expenses. This brings the total up to 50% even without allowing for those large parts of expenditure for maintenance of equipment and transportation which are joint as regards the various items of freight traffic or passenger traffic.

Allocating Joint Expenses.—It must not be supposed that there are no logical ways of allocating these expenses—ways which assign to various branches of railway service and to specific items of traffic their *reasonable* shares of the joint total. Railway accountants and economists are able to figure on reasonable bases what almost any kind of traffic should be charged in order to make it pay its way. The point is, that though reasonable, these methods of allocation are necessarily arbitrary and no two accountants may agree exactly as to the basis to be used. Under such circumstances, it is natural that if railways are left to themselves to compete for traffic they will tend to make such charges for hauling various shipments as they may consider expedient, with the result that they may charge much less for hauling some kinds of traffic than for others which apparently should bear just as large a share of the joint operating expenses. This makes unreasonable discrimination easy, which is the chief reason why the existence of a large proportion of joint expenses is so important in considering the railway problem.

Peculiarities of Railway Transportation Supply.—Having thus indicated the two chief conditions which affect the problem of determining railway rates from the cost side, we may sum up the factors which affect the supply of railway transportation by comparing the railway business with the ordinary kind of business. The economic theory of value ordinarily makes certain assumptions:

1. It assumes that commodities or services are divisible into units of the same kind, that is, that they are composed of equal and uniform parts, such as tons of coal, and that they may be averaged.
2. A corollary of this assumption is that there are no joint costs, but that each unit can be assigned its specific average cost, which cost can be compared with a demand price.
3. The ordinary theory further assumes that there are immediate and constant limitations set by costs which operate in a steady way, beginning with the first units of supply and varying as the supply is increased or decreased.
4. Finally, it is assumed that the business will be aban-

> doned when it is found that the products of that business cannot be sold for enough to cover costs and provide some return for capital and business enterprise.

Now all these assumptions either do not apply to the railway business or do so only in a partial way. The services performed by a railway are not uniform and are not divisible into equal units. Numerous kinds of freight and numerous passengers having different wants are hauled under various conditions, for various distances, and between different points. As we have seen, no single unit of measurement can be found which is perfectly satisfactory, even the ton-mile being subject to many shortcomings. Closely connected with this fact is the large element of joint expense which makes it impossible to assign railway costs directly or to compare them with the demand price for transportation. In the railway business there are no immediate and constant limitations on the supply of any particular kind of transportation; for, to begin with, a large part of a railway's expenses do not vary with the volume of traffic, and the situation is made still more complex by the fact that the joint expenses cannot be directly compared with the services with which they are connected.

CHAPTER XII

FALSE OR INCOMPLETE THEORIES OF RAILWAY RATES

Cost of Service.—Before attempting to formulate the correct principles of railway rate making, it seems desirable to clear the way by disposing of several false or incomplete rate theories which have gained some prominence. One should note, however, that in each one of the theories to be mentioned next there is some partial truth, and, as will appear later, by taking from each its element of truth, it is possible to build up a sound theory.

Just as in economics there are those who say that value is determined by cost of production, so in dealing with railway rates it has been proposed to have them determined by cost. The foregoing pages, however, have already prepared us to understand that there are peculiar difficulties in the way of applying a cost theory to railway rates. Even if the theory were not in itself wrong, it would be impracticable as a sole basis, for the reason that something like three-fourths of a railway's expenses are "joint" and cannot be specifically assigned to the particular class of traffic. In a report of a Senate committee some years ago the following statement was made:

> The test of cost of production, or cost of service, which is commonly regarded as useful in the determination of fair compensation, has been shown to be inapplicable to the charges for specific railway services, owing to the complexity of railway traffic and the fact that many of the expenses of conducting the railway business are incurred on behalf of the entire body of traffic between particular points and of particu-

> lar kinds. For this reason, it is generally true, not only that there is no ascertainable cost of performing a particular service, but that there is actually no sum which can be assigned as the real cost of any single service.[1]

It may be added that the railway business is so affected by seasonal variations and by contingencies that any cost basis would necessarily have to be a rough average of different seasons or years. Moreover, the costs differ on different roads. What, for example, is the cost of hauling a bushel of wheat from Buffalo to New York—is it the cost of the New York Central, the Delaware, Lackawanna and Western, the Lehigh Valley, the Erie, or the Erie Canal? And if it be suggested that the highest necessary cost would serve as a basis, we are merely thrown back on the question, what is the highest necessary cost, a question to which competition can in this business give us no answer.

Cost a One-Sided Basis.—A more fundamental objection to cost as a basis, however, lies in the one-sided character of such a basis. The outstanding argument against it is the fact that the cost basis ignores the utility of the service, or the demand side. Cost is only one side of the problem. As a result, a cost basis would give no assurance that railways would be used to the best advantage. On the one hand, *low-grade commodities* which might be wanted at certain destinations could not be moved thither because the cost, and consequently, the rate if based on cost, would be greater than the price that could be paid for them. On the other hand, if rates were limited to cost, there might be no adequate development of transportation for *goods which are in great demand.* To insure the movement of milk, fruit, meat, etc., the development of expensive special facilities has been required, and if rates had been strictly confined to the bare cost of transportation it may be doubted whether the necessary devices and organization would have been developed.

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[1] Digest of Senate Hearing, 1906, page 24.

Another point may be made which serves to illustrate the one-sidedness of a cost basis,—the point that the rate itself may determine the cost, or in other words, that cost may within limits be dependent upon the rate. Though apt to be overworked, there is a certain element of truth in this point, since a reduction in rates sometimes results in increased traffic, which, in turn, leads to lower operating expenses per unit of traffic.

Element of Truth in Cost Theory.—While the cost theory taken by itself is both impracticable and fallacious, it contains a partial truth which should not be overlooked, and it serves as a much needed corrective to some of the other theories which will be mentioned. This is well brought out by a further examination of the point that costs are dependent upon rates. As a matter of fact, there are decided limits to such dependence. Traffic conditions, for instance, might make it impossible to increase the volume by reducing rates, as would be the case in a sparsely settled territory where no large volume would be forthcoming even if the rates were reduced to zero. Furthermore, as already pointed out, when the rate reduction increases traffic to a point which requires increased investment or some fundamental changes in service, such as the addition of new trains, the result is an increase in cost, not a decrease. Finally, there is a limit to the point when applied to the traffic as a whole, which should not be overlooked. If discrimination is to be avoided and the rate level in general is thought of, it is obvious that as rates are reduced there must come a time, whatever the volume of traffic, when the business would be operated at a loss. After all, costs must continually set a limit, and, *while rates might be reduced to zero, costs could never be so reduced.*

Distance Theory.—A special phase of the cost theory is that which would base rates on mileage or distance. There are several plans which fall under this head. The proposal may be for a *flat rate* of so many cents per hundred pounds per mile, which would make the transportation charge increase in proportion to the distance; or it may be proposed to have a *regularly decreasing rate* per mile, which would make the total charge increase at a less rapid rate than the distance. Most frequently in practice mileage rate schemes are based on some irregular decrease in the charge per mile as the distance covered by the shipment increases, as is illustrated by the tapering mileage scheme in the Central Freight Association territory or the percentage zones of the Chicago–New York rate structure, which will be discussed in Chapter XXII.

Whatever the scheme, however, it may be urged against all distance bases for rates that as they assume that costs are related to distance, they have some of the weaknesses of a cost basis. An objection to distance as to all cost bases lies in its neglect of the utility of the service and the ability of shippers to pay.

But even from the cost standpoint distance does not furnish an adequate basis, for the fact is that a large part of railway expenses do not vary with distance. Notably the terminal expenses, which amount to a very considerable proportion of the total, have no relation to distance, and would be the same whether the shipment moved two miles or two hundred miles. Maintenance expenses which largely depend on natural deterioration would not be reflected in charges based on distance, and all the expense of labor which is paid by the hour has no direct relation to distance. Engineers tell us that at most the cost of the line haul increases only as the square root of the distance.

Postage Stamp Theory.—While this theory has never gained much of a following, it is of interest as being the opposite of the distance theory. The postage stamp theory of rates would have a flat charge made regardless of distance, much as the Post Office Department charges for handling letters. It is illustrated to some extent by the practice of "blanketing" wide territories and applying the same rate from all points outside to any point in the territory. Thus commodity rates from the whole eastern part of the United States to the Pacific Coast have been the same.

It is argued by the few who have defended this idea, that the railway business is a public utility and that it should be put at the disposal of everyone on a uniform basis, and one which would eliminate distance as a factor.

We may dismiss this proposal with short consideration. It is fundamentally unsound in that it *does away with the cost test* and would doubtless encourage a tremendous *waste* in transportation. In fact, it has no economic basis, as it disregards both cost and demand. The basis used in charging for mail matter works only because the amount involved is so small. Mail matter is rather uniform, and a 2-cent stamp is to most people a negligible payment. Freight, however, varies so widely, both as to cost of transportation and the demand for the service, that it seems entirely impracticable to adopt any uniform charge. The expenses of operating the transportation system of the country, too, are so enormous that it would be almost unthinkable to allow them to be increased without reference to cost. Such a method of basing rates could only be put in effect under government operation.

This theory lays the emphasis in an exaggerated way upon the public utility aspect of railways. It is well to realize to the full this aspect. Under any conditions that are likely to exist in the near future, it seems clear that in operating a machine which is as expensive as the railway, and one which is so interwoven with industry, it is essential that economy and business considerations should have due weight.

"What the Traffic Will Bear."—Probably the most frequently mentioned principle of rate making is that known as charging what the traffic will bear. It is a sad commentary on popular thought that this should be true, for in reality these words cover up a group of hazy ideas and tend to obscure the issue. In the first place, the phrase begs the whole question. The question before us is, What rate will the traffic bear? Therefore, to propound that rates shall be determined by "what the traffic will bear" gets us nowhere. The question we are asking is merely put in another way without suggesting any answer. What the traffic will bear is to be the rate, but what is the amount?

The proponent of the what-the-traffic-will-bear idea, however, may say that he means something more definite and that he does not intend to beg the question. The trouble is that he may mean any one of four or five different things.

> 1. He may mean what the traffic will bear and move at all; or in other words, the highest possible rate that could be charged without shutting off traffic. Such an idea as this was perhaps in the heads of railway managers when they proposed this basis of rate making toward the end of the nineteenth century.
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> 2. If, however, the thinker is inclined to favor more moderate charges, he may have in mind an idea which is equivalent to charging what the traffic will bear and move *freely,* which would mean not the maximum rates but rates which would allow each class of traffic to move in large volume—though how large a volume is to be encouraged remains indefinite.
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> 3. Again, this idea may mean what the traffic will bear without being diverted to some other route by land or water. In this case, "what the traffic will bear" would be something lower than in the first case.
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> 4. Another idea that may lurk behind the phrase is that of custom—what is the traffic used to bearing?

5. Or there may be an ethical idea in the phrase, and the one who proposes it may really have in mind the question, what *ought* the traffic to bear? If this is the idea there can be little doubt that what is in mind is some preconceived idea of what constitutes a just railway rate, which would merely take us back to some other theory, in which costs, or demand, or both would play various parts.

Economic Fallacy.—In more positive criticism it may be pointed out that "what the traffic will bear" furnishes no protection to shippers, and may easily be made the basis for rates which are unreasonably high. To take an extreme case, the shipments in question may be absolutely necessary at the point of destination, as, for example, has been the case in times of ice famine in certain cities. Then the traffic would bear almost any rate and might be made the basis of extortion.

On the other hand, it furnishes no ground for refusing transportation to goods which are in little demand and which could not, therefore, stand any but very low rates. There are cases in which it is desirable that the carriers should not undertake to move commodities, for the reason that the utility of the service is less than the cost of performing it and the haul would mean economic waste. There are cases of waste transportation due to the participation of very circuitous routes which divert goods from the more direct and economical channels of transportation, resulting in long, roundabout hauls which cost more than the rate. To charge on the basis of what the traffic will bear would allow the continuation of wasteful transportation.

Clearly, the phrase now under consideration is but a group of words which gives us little help toward ascertaining a law of rate making, as it is extremely vague and indefinite, and in reality begs the question which it seeks to answer. More than that, it is likely to result in unreasonable rates, as it allows at the same time extortionate charges where the demand is great and uneconomic transportation where the demand is small.

The Keep-Everybody-in-Business Basis.—The idea suggested by this heading is in reality a close relative to what-the-traffic-will-bear theory, and might have been treated together with it. It is often to be noted in rate discussions that the argument is made that various cities or sections of the country have "rights" which should be protected in making railway rates. Sometimes this right is based upon alleged natural advantages of location; sometimes it rests on a long established practice; sometimes it is merely a claim to a place in the sun, along with other localities. Indianapolis has insisted that she be allowed to develop as a manufacturing center along with Chicago, St. Louis, and Pittsburgh, and has insisted on rates which would favor that ambition. Boston insists on maintaining her ancient development as an export and import center. Jacksonville, Fla., and Spokane have their respective "rights" which are loudly defended. The carriers which serve such points or sections have an interest in the matter in that they desire to develop a larger volume of traffic, and are apt to favor what is called "equalization" by making rate adjustments or differentials which will allow their territory to compete with others. Thus it comes to be proposed that rates should be made with little reference to cost or to demand, but should be made on grounds of expediency with the idea of keeping everybody in business.

This idea is subject to the last criticism made of "what the traffic will bear," as it is apt to lead to waste and uneconomic development. To the extent that it favors reasonable and economic competition among markets and affords opportunity for industrial development which will, in the end, compensate for any present losses, it may have real merit;

but it does not in itself furnish an adequate basis of rate making.

The Interstate Commerce Commission, in its annual report for 1904, makes the following statement:

> That rates should be fixed in inverse proportion to the natural advantages of competing towns with the view of equalizing "commercial conditions," as they are sometimes described, is a proposition unsupported by law, and quite at variance with every consideration of justice. Each community is entitled to the benefits arising from its location and natural conditions, and the exaction of charges, unreasonable in themselves or relatively unjust, by which those benefits are neutralized or impaired, contravenes alike the provisions and the policy of the Statute.[2]

Value of Service.—Among economic writers on railway transportation it is common to suggest that "value of service" furnishes a good basis for rate making. Without mincing matters, however, it should be noted at once that the phrase begs the whole question of rate determination. *The railway rate is the value of the transportation service,* if that rate is freely determined. What is the value of the service? That is the question we are seeking to answer. How, then, can anyone seriously say that rates should be determined by value of service?

To be sure, those who propose this basis have something in mind which is a little more definite than the phrase which they use as a slogan. They probably have the idea that it means the value of the service to the shipper. That would mean that it is proposed to base railway rates on the individual valuations of shippers, or upon demand alone. So stated the theory is obviously one-sided and incomplete, for it leaves out of consideration the cost of the service. It is correct so far as it goes to emphasize the fact that the demand for transportation, resting upon the utility of the service to the shipper and the shipper's purchasing power, is a very important factor in determining railway rates; but it is incorrect to think that rates could be based merely upon the subjective valuations of shippers. As long as railways are economically constructed and operated, we shall have to count the cost.

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[2] Eau Claire Board of Trade *v.* Chicago, Milwaukee and St. Paul, *et al.,* 5 I.C.C. Report 264.

The conclusion must be that the value-of-the-service theory is either a mere question-begging phrase, or is a one-sided and incomplete theory. We note that this theory may serve to correct the one-sidedness of the cost theory, and that when the two are combined they may furnish the basis for a correct statement.

Public Policy Basis.—Perhaps on account of the complexity and difficulty of the subject, some economists have practically given up the attempt to state a principle of rate making that is definite, and, under the influence of the idea that the carriers are fundamentally affected with a public interest, have merely proposed that rates be made as public policy dictates. One has written, "Both absolute and relative rates should be adjusted according to the demands of the public interest."[3] A very little consideration will show that such a basis gets us nowhere. It merely creates a general atmosphere, in which the thinker is called upon to recognize that principles of social justice and public welfare must be considered in making railway rates.

But in the first place, it is to be remembered that in the United States the railways are privately owned and privately operated. This is likely to be true for many years. As private ownership and operation are to be continued, business considerations must be given sufficient attention to encourage private initiative and private capital. The public is not to be damned, but neither is that part of the public which has invested in railways. Therefore, rates must be made not only according to the demands of public interest but also according to the demands of the private interests which are involved.

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[3] Smalley, H. S., *Railroad Rate Control in its Legal Aspects*, page 45.

In fact, the question is at once suggested, What constitutes public interest or public utility? Is it to the interest of the public that rates should be made without reference to cost? Those who propose the principle of public utility are prone to argue that cost cannot be determined and may be ignored. But it can be demonstrated that to ignore cost in rate making would lead to such great waste and to such arbitrary action by any body which might be set up to determine what the public policy is, that in reality it would be highly improbable that the goal of public utility would be attained. Either the principle of public utility means nothing as a definite or practical basis for making rates, or it means a departure from economic considerations and regard for cost which would be opposed to public welfare. We have had too much of the improvement of wan and wandering waterways and the construction of palatial post office buildings to enable us to regard "public policy" seriously as a guide in rate making.

Value of Commodities.—Closely related to the public policy idea is the proposal that rates should be based on the value of the commodities transported. This is a sort of tax theory of railway rates, which would base the charge upon the ability of the commodities to pay. It is subject to criticism on several grounds.

In the first place, the value of the transportation service does not depend entirely upon, nor have a direct relation to the value of the *commodity* transported. There is some connection—more important in certain cases than in others—but under the circumstances it would be as illogical to determine the value of the transportation service by the value of the goods hauled as it would be to determine wages by the value of the commodity upon which the laborer works. Certainly cost would be practically left out of consideration, to say nothing of supply, and in many cases even demand may not vary with the value of the commodity.

In the second place, the *value of the commodity is often indirectly controlled by the railway rate,* and to base rates on commodity values would therefore get us into a vicious circle. When the railway rates on coal are advanced, the price of coal to the consumer also goes up; and in the case of all bulky goods which are transported by rail, the rate is an important factor in the delivered price. To base rates on the value of commodities would be like imposing an *ad valorem* tariff on the basis of domestic valuation of goods and arguing that the higher the domestic valuation the higher must be the tariff!

In the third place, rates would have to vary with fluctuations in market values which would either result in serious practical difficulties, or in the partial abandonment of the proposed theory. It would be practically inexpedient to have rates fluctuating from day to day, or even from month to month, according to the ups and downs of commodity values.

In the fourth place, to base rates solely on commodity value would eliminate any consideration of the *cost of transportation,* which, as has been pointed out, would result in an uneconomical use of our railways.

Finally, as in taxation, so in any scheme according to which railway rates would be based on commodity prices, values would be only relative; there would be no basis for determining the absolute amount of the rate. A well-known text on transportation has said something about "taxing the producers of grain a certain percentage of its value"; but what percentage, and just what would be the rate in cents per bushel or per hundred pounds? To decide that the rate on one commodity should be higher than the rate on another commodity may give us some basis for relative rates but it gets us nowhere in the determination of an absolute rate basis.

Taxation Not Analogous.—It is a sound principle of taxation to levy on each citizen in proportion to his ability to pay. Taxation exists for the purpose of supporting government, and government exists for the common welfare as measured not only by economic considerations but many others. Government never has been and never should be run as a business—although more attention to economy may often be desirable. Such being the case, taxation is determined partly by ethical and political considerations, and its amount is left to the determination of political machinery. In the balancing of government budgets there need be little of that balancing of cost against utility, or of supply against demand, which is essential for the effective operation of railways. Taxation has a largely ethical basis. Will anyone advocate the running of our railways on such a basis?

We conclude, therefore, that commodity values, while they have their significance in so far as they may affect the demand for or the supply of transportation, do not afford either a logical or a practical basis for making railway rates, and that the analogy of taxation cannot be closely applied, as the financing of government operations is fundamentally different from the conduct of the railway business.

CHAPTER XIII

A TRUE THEORY OF RATES

Particular Rates vs. General Level of Rates.—The first step to be taken in constructing a true principle of rate making is to recognize the difference between the general level of rates and particular or individual rates. The general rate level finds expression in the total operating revenue of the railway, and may be thought of as reflected in the average receipts per ton per mile of all freight. It is the general level of rates which is involved when the question of a flat percentage advance in rates is raised. Thus when in 1922 rates were reduced by 10%, it was the general level that was affected. The primary question connected with the general rate level is the return upon railway investment, and it was because the Interstate Commerce Commission believed that the carriers could earn 5.75% upon their investments with a lower average rate that the 10% reduction was ordered. Prior to that time there had been a series of general rate advances, which were caused by the failure of the carriers to earn a fair return on the capital invested.

Clearly, this is a matter pertaining to the demand for, and the supply of, railway facilities as a whole. When society requires more track, more cars, and more terminal facilities, society must pay more for the railway service, and if there is no way apparent of meeting the situation by advancing the rates on some particular commodities, the natural recourse is to raise all rates. Or if railway operating expenses increase to a point where operation ceases to be profitable, society must pay more in order to insure the continuance and development of its railway plant, and the general level of rates must be increased.

At other times, however, the rate question is one which merely involves particular rates. It may be that the railways are earning adequate returns, but that the rates from some cities to an important market are so low that other cities cannot compete on even terms and demand either that their rates be similarly reduced or that the rates enjoyed by the favored city be advanced. In such cases the matter is one of discrimination in particular rates. Some individual rate is involved, and the question is one of its right relation to other rates. To be sure the raising or lowering of an individual rate will affect the total revenue or the average receipts per ton-mile and consequently the return upon investment. Such effects, however, are merely incidental. The problem is primarily one of discrimination, or relative reasonableness, and exists regardless of whether the carrier is earning a fair return on investment or not.

The problem of the general level of rates is concerned with total operating expenses, while in the case of the particular rates the only immediate consideration is the particular cost of the particular service performed in transporting some particular commodity.

The question of determining the general level of rates will be taken up in Chapter XV. Thus far the discussion has centered primarily in the question of relative rates, and we are seeking to develop a principle according to which the correct rate may be made for some particular commodity, taking into consideration the cost of transporting that commodity. Back of this question, it must be remembered, lies the necessity of maintaining a general rate level which will enable the carriers to earn a fair return on their investment. For the present, however, we shall assume that we are in a position to do this and shall refer to the general rate level only incidentally.

Economic vs. Non-economic Standards.—There are two standards possible in judging the reasonableness of railway rates. One is purely economic; the other may be all or partly ethical, or it may be chiefly political; but whatever its chief basis, the factors considered are not economic. An economic standard of rate making is one which makes everything depend on a balance of utility and cost. It considers the expenditure of labor and the use of land and capital required, and against these sets the net income to be derived. It does not inquire whether the building of a railway or the amount of a rate is right or wrong, nor whether politics makes it expedient. The question is, does it pay?

It is conducive to clear thinking frankly to recognize that in making rates other than economic considerations are required. During the war the public defense was a consideration which transcended purely economic factors, and rates were made with reference to the needs of the country. For example, very low rates were made on manganese. Too often, however, political considerations are dangerous in rate making. Under the influence of a strong political group in Congress special rate reductions have been made on hay, grain, and livestock, for which no economic justification is possible and which certainly amount to discrimination. Almost always when the real question is one of political expediency or right and wrong, there is an effort to justify the proposal on economic ground, with the result that thinking becomes muddled. The proposal is made first and then arguments are scraped together in its defense.

Without going into detail it may be concluded that in a vast majority of cases economic considerations should prevail, and that where other considerations arise, it is essential that they be distinctly stated and compared with the economic considerations. In this way only can muddle-headedness be prevented. When it is proposed to make a rate reduction on the ground of the "rights" of some community or section, the nature and basis of those rights should first be clearly stated. Then the balance between cost and income should be struck, and finally a decision should be made after comparing the desirability of preserving the alleged rights with the net cost of making the change.

Unregulated Competition in Rates Impracticable.—Economists have been able to formulate pretty definitely the principles which govern the determination of value and price in the ordinary kind of industry and under competition. The railway, however, is not an ordinary kind of industry, and is not subject to competition in the ordinary way. It must be frankly admitted that, in a sense, railways are natural monopolies, and that direct competition in rates will not work in the railway business. The carriers will compete in service, and will lend themselves to the furtherance of competition among the cities which they severally serve, but as between railways which serve the same points, in the matter of naming rates it has been found that any competition which arises is sporadic and soon passes away. Direct railway rate competition tends to become "cutthroat" and cannot normally exist.[1]

Requirements for Effective Working of Competition.—The successful working of competition supposes that costs can be known and that price tends to equal costs, including a return on capital and business enterprise. The inefficient or high-cost companies are forced to drop out; the efficient or low-cost companies grow; supply is quickly adjusted to demand—these are the assumptions with regard to industries which are not natural monopolies. In the case of railways, however, inefficient companies do not drop out, for the weaker lines struggle on and demoralize rates till they fall into the hands of the receiver. The receiver continues to operate them; they are reorganized and relieved of their most pressing obligations, but continue to operate and are often still weak. On the other hand, the efficient railway companies do not win out, but ever have to confront the bankrupt carriers and the struggling circuitous routes which can only secure business by making rate concessions. The history of such railways as the Wabash and the Erie amply illustrates the situation.

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[1] The competition which exists among railways is discussed in Chapter XVI.

This survival of the unfit is primarily due to the large investment which is sunk in highly specialized forms of capital that can only be salvaged by continued operation. But the close relation of the railway to social, political, and legal considerations is also to be noted. Under the law a common carrier cannot at will abandon operation and wind up its affairs, for it is regarded as having assumed obligations to society which it must carry out. Thousands of homes have been built along its line, and industrial arrangements have been made on the assumption that it will continue to operate. Recently, for example, the Kansas City, Mexico and Orient, being in a bankrupt condition, sought to abandon its property and cease operation. Even in the relatively undeveloped territory served by that road, however, it was deemed imperative that it continue to operate, and strenuous measures were taken to reorganize its affairs in order to prevent the widespread losses and hardships which would be suffered by the little communities and farms dependent upon it.

Railway Rates Tend to Follow Law of Monopoly Price.— For these reasons competition in rates will not work in the railway business as it does in many kinds of enterprise. The initial investment is so large and so specialized in form, there is so little relation between operating expenses and rates, and the obligations assumed by the common carriers are so continuous, that fitness does not determine survival. Therefore, railway rates tend to obey the law of monopoly price, and if the carriers were left to themselves without regulation, the only limitation upon the operation of that law would be such competition as might be offered by water routes or highways, and competition in service.[2]

The law of monopoly price is that in a monopolistic industry prices are fixed at such a level that they will yield the highest net return. Accordingly, the conclusion must be drawn that railways *tend* to adjust their rates so that in the aggregate they will yield the highest net return upon the railway investment.

How the Law of Monopoly Price Works.—While remembering that the law of monopoly price is not actually allowed to work itself out, it is still important to consider how it would work if it could, since the tendency is always there. How, then, is the highest net return to be secured in the railway business? Three points seem clear:

> 1. *No rate would be fixed which would be permanently below the direct cost* of the particular service involved, by direct cost meaning the cost which would disappear if the particular service were withdrawn. This direct cost would have to set a minimum, for any rate below that minimum would mean a reduction in net returns. This cost would have to include a part of the variable transportation and maintenance expenses, and the cost of handling at terminals, keeping records, and the like. However small might be the amount of added expense that could be specifically attributed to any class of traffic, it would be significant as furnishing a minimum below which the monopolist could not go without failing to observe the law of monopoly price, and, consequently, failing to secure the highest net return.
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> 2. *No rate could be permanently so high that it would*

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[2] Also, from time to time the growth of cities, producing areas, etc., may disturb a settled rate structure and cause competition in rates temporarily.

shut off traffic that might increase net returns. The railway monopoly would have it in its power to name rates as high as it might please, but there would be no pleasure in fixing rates so high that profitable traffic would be reduced in amount.

3. *If allowed to act as monopolies, railways would tend to fix rates somewhere between the minimum and the maximum points indicated,* so that the product, ton-miles x rate, would be equal to maximum total net revenue.

Monopoly Class Price.—It is highly important to observe that the idea of monopoly class price enters at this point. It is often impossible to secure the highest net revenue by charging all customers the same price for the same service. Accordingly, the monopolist, in seeking the highest net return, often classifies his customers or branches of business according to their ability to pay, and seeks to secure the maximum price for each class.

Everyone is familiar with the practice of putting out goods which are practically the same under different labels or other superficial distinguishing marks, and charging different prices. This was once the practice of the Standard Oil Trust in making different prices for different "grades" of kerosene. The publishers of copyright books often get out series of different editions, ranging from limited "de luxe" issues, perhaps autographed, down to "popular editions," which are sold at widely different prices—prices which differ much more widely than do the expenses of the different editions.

In the railway business this tendency to get a maximum total net return by charging each class of traffic the most it will bear, is especially strong, for the reason that the costs are so largely joint and indeterminate. This is why such ideas as "value of service," "what the traffic will bear," and "value of the commodity" have gained such prominence. "Low-grade traffic," which has little value, although it may cost as much to move it, cannot bear so high a rate as can high-grade traffic, and accordingly, is allowed to move on special commodity rates, while the higher grades of traffic are arranged in a series of classes which are charged widely different rates, often with but little reference to the relative cost of transporting them. The cost of handling and moving the higher grades may or may not be greater than is the case with the lower grades. The point is, that *the difference in the rate charged is not in proportion to the difference in the cost.* Local rates are apt to be higher than through rates. Points having water competition have rate advantages over those which do not. Passengers who can afford it are given an opportunity to pay disproportionately high prices for superfine service. In these ways the carriers, even today, seek to secure a maximum net return, and if they were subject to no regulation, the discrimination among classes of traffic would be much more marked.

Government Regulation.—Today, even though regulated and subject to some competition, the railways are partial monopolies. Government regulation does not make them any less so. What it does is to make the discriminations which arise under the principle of monopoly class price more reasonable than they otherwise would be, and to eliminate the maximum net revenue basis of discrimination. The government says to the railways, "You may put this commodity into your 'first class' and charge it accordingly high rates, and you may give the other commodity a special low 'commodity rate'; but you shall do this not arbitrarily and for the mere purpose of increasing your net earnings to a maximum, but shall do it because it seems reasonable, taking into consideration the estimated relative expenses as well as the ability of the traffic to bear the rates."

The Law of Monopoly Price Greatly Limited in Its Application.—But the monopoly of the railway is only partial. In the first place, railways are limited in their charges by the interests of the producers who furnish their traffic, and consequently must adapt rates to the competition which exists between various producing centers for the same markets. The ocean, lakes, canals, rivers, and highways, all directly or indirectly affect railway charges and set limits to their ability to secure the maximum net return. Finally, as already indicated, government regulation has tended to reduce the discrimination by emphasizing cost as a basis of classification. In fact, we do not find rates which are determined on a purely monopolistic basis, but rather rates which are fixed by government regulation. The point is that government policies are necessarily adapted to or affected by the inherent character of the railway business, and are accordingly influenced by the tendency to monopoly which is characteristic of those operations.

We may say that railway rates as they now exist in the United States are the result of a struggle and compromise between three groups of forces:

1. The inherent monopolistic tendency to secure the highest net return and to classify traffic on the basis of what it will bear.
2. The elements of competition which always limit the railways' monopoly, and especially competition among markets and with waterways and highways.
3. Government regulation with its emphasis of cost and of broader considerations of social welfare.

Today government regulation is the dominant factor and the Interstate Commerce Commission is empowered to name definite rates. The railways cannot change an interstate rate without the approval of the Interstate Commerce Commission. The practical question, therefore, which confronts us is what basis should the government use in fixing rates or apply as a criterion in approving rates proposed by the carriers.

Principle of Competitive Exchange Value the Best "Basis."—The thesis of this work is that the most practical, expedient, and economic railway rates are those which would be established by competition if competition could work effectively in the railway business. While recognizing that direct competition between railways in rates does not work, it is also to be recognized that no economic agency is sufficiently wise and unbiased to determine values on an arbitrary basis. At best, men's judgments are colored by predispositions and prejudices, and governmental bodies are subject to political influences. The wisest captains of industry know that they cannot safely undertake to substitute their individual judgments for the forces of demand and supply. Recently, in talking with the responsible officer of a great industrial corporation, the author was surprised to have it frankly acknowledged that prices fixed by agreement within the industry would be unwise, for the reason that human intelligence would not enable the determination of a price which would satisfactorily equilibrate demand and supply. Said he, "The price of our product was recently established on too high a level, with the result that there has been overproduction and we are now paying the penalty of a severe reaction in the market. I see no way of determining a correct price other than to put our goods on the market and sell them for what they will bring. The conditions affecting production and consumption are so complicated that no man can say with certainty what the value of his product is."

Of course, to work out the true value, the forces of demand and supply must operate under intelligent direction, and notably each producer must know his expenses and the technique of his business, including markets and methods of distribution. Under abnormal conditions of panic and ignorance free competition may lead to the establishment of abnormal economic values, much as disturbances in temperature or currents of air might lead to the registration of incorrect weights by a delicate balance. But the objective determination of economic values in a competitive market is the ideal, and it is believed that the only correct principle of rate making lies in an attempt to approximate such a determination.

Economists have carefully studied the determination of economic value under competition, and the science of economics provides the means of so analyzing and weighing the factors in demand and supply that even in as complicated a matter as the determination of railway rates we may approximate an equilibration of those factors which will result in rates which may with confidence be said to be what competition would establish if it could work.

Determining Normal Value under Competition—Marginal Demand Price.—In the introductory paragraphs in Chapter XI, something has already been said of the nature and function of economic value. It will now be well to go into the matter a little more intensively and with more direct reference to the problem in hand. Free competition determines value at a point where the marginal demand price and the marginal supply price are equal. In the railway business the marginal demand price is the sum that the shipper whose demand for transportation is the least, will pay. We may think of all the shippers of a given product in a given producing territory as being arranged in the order of the amount per hundred pounds that each is willing to pay for the transportation of his product. Let us say that there are ten manufacturers of shoes in St. Louis. Each one has a different cost of producing shoes, and there may also be differences in their success in marketing, which result in different wholesale prices they secure at the point of destination to which they are shipping. At the top of the series is the shoe manufacturer whose cost of production is the lowest and who secures the best delivered price for his product. He would be willing to pay a much higher railway rate than would the tenth manufacturer whose cost of production is the highest and who secures the lowest delivered price. This tenth or marginal shipper can barely afford to pay the existing rate. His "demand price" for transportation is the marginal demand price.

Marginal Supply Price.—On the other hand, the marginal supply price is the least that the railways can afford to accept for the transportation service. There are several railways out of St. Louis, having different operating expenses and different traffic problems, such as empty back haul and the like. Moreover, each one of the railways has a series of cost levels, which, as they are successively impinged upon, offer increased resistance to reductions in rates. The highest level is a pro rata share of all expenses, including fixed charges. If under competition the railway cannot secure from the shipper of shoes a rate high enough to equal this cost level, it will seek to secure enough to cover all transportation expenses, including both terminal charges and the expenses of the line haul. Below this second cost level lies a minimum level set by the cost which would be added by the particular shipment. This may be called the "specific cost." It would be barely enough to defray the expense of loading and unloading the shipment (if it is L. C. L. freight), the expense of making the records that are involved, of collecting from the shipper, and an allowance for loss and damage claims. This minimum should generally also include a share of the line-haul expenses based on the average ton-mile operating expense; but in case of an empty back haul even this item may not be required.

Of course, there are many more possibilities than the three levels here suggested. These three levels have been mentioned merely to bring out the idea of the railway's marginal supply price, and we are now in a position to say that this marginal supply price of transportation is normally *the least charge that can be accepted without incurring a loss by the railway which needs the business most or which is least efficient.*

It will be noted that the idea of loss is not absolute. As already explained (page 175*f.*), a railway's expenses are such that it may accept the traffic without loss which merely covers the added cost of taking on that particular traffic. When traffic will not bear more than this it cannot be said to be a loss to handle the traffic at the minimum level. It must, however, be insisted that no traffic can be hauled for less than the minimum level suggested without loss, and that under competition no rates could normally persist which would be below that level—unless we were to accept the idea of price "leaders," such as are made by department stores, which is almost always open to question as a competitive device, and which would be intolerable in the business of a common carrier.

Balance between Marginal Demand and Supply Prices.—If the reader has followed the foregoing discussion, it will be easy to grasp the idea of a group of shippers, each with a particular, individual, marginal demand price, which group confronts a group of carriers, each of which has its particular marginal supply price of transportation. Of course, there are at least as many groups of shippers as there are kinds of business. For the transportation of each commodity, therefore, there is a separate balance between a group of shippers' marginal demand prices and carriers' marginal supply prices. When these marginal demand prices and marginal supply prices are in equilibrium, the true economic rate is determined. Let us first inquire more fully what conditions determine the strength of the demand price and the supply price.

Factors Determining Demand Price—1. Shippers' Profit.—The demand price of a shipper for transportation depends upon a group of factors, each one of which must be carefully considered in order to determine how high the rate may be. These factors will be taken up roughly in the order of their importance.

Probably the simplest case of demand for transportation is that which is derived immediately from the wants of the consumer. When an individual orders from some mail-order house a bill of goods on which he has to pay the freight, he has acted because he wants the goods in his home where he can consume them. The demand for transportation is incidental to the demand for the goods. The more intense the want of the prospective consumer, the greater the demand for transportation and the higher the rate which the carrier might charge.

The great bulk of freight, however, consists of goods which are shipped by manufacturers, merchants, etc. Their demand for transportation is not immediately connected with the wants of the ultimate consumer. The underlying basis of their demand for transportation—which applies to most of the railways' business—is the profit secured by the person or firm which is responsible for making the shipment. When goods are shipped from one market to another, it is ordinarily due to the fact that they meet a greater demand at the point of destination than they had at the point of origin. Much as a spark jumps from the positive pole to the negative, goods move from places where they have a lower level of valuation to places where they find higher valuations. To carry the analogy further, if the distance between the two poles is too great, or some non-conducting material intervenes, the transfer of electricity does not take place. Just so, if the cost of transportation or the rate is too high, the shipment will not normally occur.

The typical case is that of a manufacturer who is shipping his product at a price which includes freight. The manufacturer has a certain cost of production, which we assume to be $1 per unit of his product. The price at which that product is selling in a city 100 miles away from his plant is $1.50 per unit. The difference between his cost and the price in the distant city is 50 cents. Obviously, this manufacturer could pay a freight rate amounting to 50 cents per unit without loss. The utmost limit of his demand for transportation is set by the spread between his cost f.o.b. cars at the factory and the market price at destination. As a matter of fact, he must ordinarily make sufficient profit to reward him for the risks and services which are involved in his business enterprise, and consequently the maximum of his demand for transportation is measured by a sum which is somewhat less than 50 cents; say 40 cents.

Similarly, a retail merchant who orders goods from a wholesaler has to pay a certain price f.o.b. cars at the point where the wholesaler is located, and must sell the goods to his customers at a price somewhat above his cost. The difference between the two figures, allowing for his profit, constitutes his maximum demand price for transportation.

In short, the ordinary basis of *demand* for transportation lies immediately in the difference between the cost of production, or the cost of goods purchased, at some point of origin and the price at which the goods *can be sold* at the point of destination.

Freight Rate and Price Affected by Demand in the Same Way.—The question which naturally arises at this point is—Does the price of the goods at destination not depend in part upon the freight rate and consequently is it not reasoning in a circle to say that the demand for transportation depends upon the difference between cost and delivered price? The answer to this question is as follows. In the first place, it is not our thesis that the *rate* depends upon the difference in price, but that the *demand for transportation* partly depends upon the difference between cost at one point and price at another. It is only the demand side of rate determination that we are dealing with at present, and it is only claimed that demand partly depends upon the margin of profit.

In the second place, with reference to demand, the circularity of reasoning is only apparent. It is true that the price at the point of destination is related to the freight rate and that the two tend to vary in the same direction, but it does not follow that one is the cause of the other. The fact is that in so far as demand is concerned, both rate and price depend upon the working of the same valuation process, and their variation in the same direction is due to the fact that they are the *results of a common cause.* When the price of shoes is determined at Nashville, Tenn.—assuming competition to prevail—it must, in the long run, be fixed at a level which will enable the dealers at that point to clear their stocks at a reasonable profit, and it will be such that the demand prices of the marginal buyers of shoes will coincide with the supply prices of the marginal shoe dealers.

The demand prices of the buyers are determined independently of railway rates. A part of the considerations which determine the supply price of the marginal dealer, is his operating expense plus the cost of the shoes to him.

A Shoe Dealer's Demand for Transportation.—Let us assume any given quantity of shoes in stock, and that with this quantity the marginal buyers' demand price is $8 per pair. On the other side of the problem are the marginal dealers' economic costs. These are: operating expenses, losses, and fixed charges, $1.90; interest and profits, $1; total $2.90. The margin between these items and the marginal demand price is $5.10, and this sum represents the *dealer's* demand for shoes delivered to him, including the price f.o.b. factory ($5) and a balance of 10 cents for the transportation of a pair of shoes Therefore, any dealer's demand price for the transportation of shoes is determined partly by the marginal buyer's demand price of shoes and partly by his own costs and operating expenses as a dealer. If buyers are willing to pay high prices for shoes and the dealer operates efficiently, he will be willing to pay larger freight rates. If we assume a given cost price of shoes based on cost of production at the point of origin, the demand for transportation of those shoes depends upon the process by which the shoes are valued at the point of destination, and is the difference between demand price and the total costs and profits of manufacturer and dealer. There is no circularity in the reasoning.

Demand for Transportation Limited by Demand for Goods; Supply Limited by Expense.—The demand of the manufacturer of shoes in St. Louis for transportation, as we have seen, depends upon the margin between his cost of production and the price of his product at destination. A complete analysis of the situation shows that the price at destination depends upon the demand and supply at that point. The demand ultimately rests upon the individual demand prices of buyers, which demand prices refer to shoes and not to manufacture or transportation as such.

The demand for transportation, like the demand for shoes at the factory, is reflected back from the demand for the shoes at the point of consumption; and depends partly on how much consumers want the shoes, and partly upon the costs and degree of competition among the shoe maunfacturers, the two latter factors determining how much of the consumer demand will be passed on to the railways.

Under competition the demand for railways depends upon the demand for the goods transported and the amount of the costs of the manufacturer and of the dealer. In other words, the railway rate, as distinct from the railways' operating expense, is a secondary value, which is affected by the price of the goods. This is but another way of saying that the railway service is not wanted for itself but only as a means of supplying wants for goods. The price does not depend upon the rate, but the rate, in so far as demand is concerned, does partly depend upon the price.

It must not be supposed that under competition it is the railway *rate* (i.e., the *value* of the transportation service) which limits the supply of shoes or other commodities at any point to which they are transported. In the last analysis it is the *cost* of the transportation service which limits the supply of transportation and of the goods which require transportation. The supply price is a composite sum covering: (1) the dealer's operating expenses, (2) railway operating expenses, and (3) interest and profits for all the capital and business enterprise involved.

2. Specific Value of the Commodity.—While the difference between price at the point of destination and the cost at the point of origin is the underlying basis of demand for transportation, there is a second factor which profoundly affects that basis. Each commodity has a certain value level which is irrespective of place. Shoes are more valuable than sand, we say, and diamonds are most valuable of all. By this we mean value in a given bulk or weight, and we have in mind that under any ordinary circumstances it would take many carloads of sand to be equal in value to a diamond. Value in this sense may be concisely indicated by the phrase "specific value." When the value of a good in proportion to its weight is small, as is the case with sand or hay, we say it has a low specific value. This is analogous to the idea of specific gravity, for we say that an object which has great weight in proportion to its bulk has a high specific gravity.

The demand for transportation varies considerably, according to the specific value, between two such commodities as coal and silk. Say that the value of coal at the point of origin is $5 per ton, and the value of silk cloth at the point of origin is $500 per ton. If a uniform rate of $1 per ton were in effect, consider how different would be the demand for transportation. After paying the rate there would be a margin left in the value of the coal of $4, while the silk would be worth $499 more than the rate. The rate in the case of the coal would be one-fifth of its value, while in the case of the silk it would be only one five-hundredth. The charge for transporting $500 worth of coal would be $100, while the $500 worth of silk would move for only $1. The value of the coal would allow it to move only one one-hundredth of the distance that the silk could move before it was exceeded by the rate.

On a certain western railway it was found that the percentage of the rate between two points to the value of the commodity varied from 59% in the case of cement down to only 3% in the case of cotton. On bituminous coal the rate was 54% of the price; on wheat it was 8%. In short, we may say that the lower the specific value, the more important is a small change in the freight rate and the less intense is the demand for the transportation service. The margin of profit per unit of weight is lower in the case of goods which have a low specific value, and the expense of transportation more quickly eats up that margin.

Demand for "Low-Grade" Commodities.—It is commonplace in discussing freight rates to point out that low-grade commodities, which means commodities having low specific value, cannot stand high rates. This is merely to say that the demand for transportation in the case of low-grade commodities is less intense. Such commodities are either ranked low in freight classifications, or are given special (commodity) ratings. It may cost as much per ton to move them as it does to move the goods having higher specific values, but the demand for transportation which is derived from the exchange of ownership of a given quantity is less than the demand derived from the exchange of a like quantity of higher class commodities. A hundred pounds, or a ton of coal or sand, is worth so much less than an equal quantity of silk or shoes that the difference between the cost at the point of origin and the price at the point of destination can never under any normal circumstances be as great as exists in the case of commodities having the higher specific value.

The result is, that the shipper's margin of profit is, in reality, a function of two variables, the one dependent upon the difference between places, and the other dependent upon the specific value. Both have to be considered, and together they determine what may be called the "specific demand for transportation."

The foregoing points are the basis of demand for transportation, but there are a number of factors which affect the working of that basis, just as the effects of the force of gravity are modified by the friction of the air or other medium through which a falling body moves. Perhaps the three chief factors which modify the demand basis with reference to transportation are the perishability or storability of the commodity, availability of substitutes, and shipper competition.

3. **Kind of Commodity.**—Among the most important conditions affecting the shipper's demand is the perishability of his shipment. Fruit, milk, and meat, for example, must be shipped at certain times and with a certain degree of rapidity,

or they deteriorate and will not bring a price at the point of destination which will yield a profit. Indeed, they may lose their value altogether. Consequently, the shipper is not in a position to hold such commodities nor to resort to cheaper but less rapid or regular transportation devices, and his demand for transportation may be correspondingly intense.

Commodities which cannot be conveniently or economically stored are similarly affected, and we have seen that this is the case with anthracite coal.

Many other illustrations of peculiarities in demand arising from the quality of the commodity might be given, but the foregoing is sufficient to indicate the idea.

4. Substitutes.—A very important factor in determining demand for transportation is the existence of substitutes for the commodity which is being shipped. The consumers' demand price at the point of destination may be held down by the fact that they can secure some other commodity which will serve the purpose at a price which is but little above that of the commodity in question. Thus the prices of anthracite coal and of stone (and the demand for their transportation) are held down by the existence of bituminous coal and cement as substitutes.

A distinct phase of substitution is furnished by cases in which the commodity in question is manufactured at points to which it is also shipped. No doubt shoes are shipped into St. Louis, but the fact that large quantities of that product are manufactured in St. Louis and could be supplied to the local dealers without the cost of transportation, must affect the intensity of the demand for transportation at that point.

5. Competition among Shippers.—When a product is monopolized by a single large shipper, the potential demand for transportation may be great, but the bargaining power of the shipper is greater than would be the case were the same volume of production marketed by a number of competing shippers. The carriers could play the competitors against one another, and the most efficient among the producers, who would be the one who could afford the highest rate, in his eagerness to secure transportation service might bid up the rate. A monopolist, however, would reverse the situation and play the railways off against one another, giving his traffic to the carrier who would name the lowest rate. This consideration is probably not one which would enter into the determination of a reasonable rate by the government, as it has been found by experience that discriminations made in favor of large shippers are a powerful weapon in the hands of monopoly.

Summary of Demand Factors.—The discussion of these various factors which determine the demand price of shippers may be summed up by saying that the maximum demand for transportation exists when a perishable commodity of high specific value for which there is no substitute, is offered by competing shippers for transportation from a point where cost of production or purchase is low to a point where price is high. Perhaps milk will illustrate such a case. Conversely, the demand for transportation is at a minimum when a low-grade commodity which is not perishable and which can be economically stored and for which there are substitutes readily available, is offered by non-competing shippers for transportation between points having small spread between cost and price. Salt and cement are commodities which more or less completely illustrate the conditions of minimum demand for transportation. Between these two extremes lie all degrees of intensity of demand.

It is not to be supposed that these different degrees of demand intensity can be readily measured or accurately determined. Under competition the method of trial and error would be applied, and it might be only after many experiments and changes that the force of the demand would be approximately gauged and would find expression in the economically correct rate. The best that could be done by a rate-regulating body would be to study all the conditions here briefly outlined, and by comparison with rates which had proved satisfactory for similar commodities to seek an approximation. The gist of the matter is that unless the foregoing points are roughly allowed for, rates will almost certainly be made which are greater or less than what would be established under competition, and which would, consequently, fail to provide the basis for the economically correct equilibration of demand and supply.

CHAPTER XIV

A TRUE THEORY OF RATES (CONTINUED)

Supply Price of Transportation—General Basis.—As we have seen, the shippers are confronted by the railways with their several scales of supply price. The problem of determining particular railway rates is only half solved by analyzing the determination of demand price. It remains to consider how the supply prices of the carriers are derived.

Unfortunately, for those who desire an easy solution of problems we are at once confronted by the fact that on account of the large element of joint costs which characterizes the railway business, the supply price for the transportation of any particular commodity is indeterminate. It is therefore necessary to proceed somewhat as follows.

First, we can say that the total of all rates received, that is, the total freight revenue, must at least equal the total operating expenses assignable to the freight service. That gives us a controlling total, and when the sum of the receipts fails to equal the total expense in the long run, we can know that some rates must be raised.

In the second place, the rate on any particular commodity must in the long run cover the *added cost* of handling and hauling that commodity. As we have seen, a specific minimum cost can be assigned to each particular shipment or class of traffic, and on this basis a minimum rate, which, though very small, is something definite, can be named.

Importance of Relative Cost.—In the third place, it can generally be known whether it *costs either more or less to* *transport one commodity than another.* This point is one which has great practical importance. As a matter of fact, it might well be that without knowing a single individual cost a fairly workable allocation of total expenses might be made on the basis of an estimate of relative costs. To be sure, such a procedure would require experiments, but many experiments have already been made in the railway business, and there are always some rates which have come to be recognized both by shipper and carrier as reasonable—rates, too, which appear rational when considered by some third party, such as the government, from the point of view of the forces of demand and supply. With such a rate as a starting point, all other rates can be built up by comparing the commodities concerned and asking, Is the demand for the transportation of one greater or less than that of the other? Does it cost more or less to haul the one than the other? At this point, however, we are only concerned with the expense side of the problem, and are emphasizing the point that, while it is impossible to determine exactly the expense of transporting any particular commodity, it is possible to arrange the thousands of commodities hauled by railways roughly in a scale, and to say that this commodity or group of commodities must involve higher transportation expense than that.

Specific Cost—Factors Affecting It.—Each carrier has for each commodity a specific cost which is the minimum supply price at which that carrier will furnish transportation for that commodity. This is true whether competition or monopoly prevails. What determines such minimum supply prices? First come those variable costs which are not joint or which, if joint, can be fairly averaged. Here lie most terminal expenses, amounting to several cents per hundred pounds in many cases. Then come certain of the transportation expenses proper, including maintenance of equipment and, at least, a part of the fuel for locomotives. Clearly, such expenses have some relation to the varying conditions which attend the transportation of different commodities, among which may be mentioned the following:

1. *Distance* is a factor. A shipment which moves 200 miles must cost more than one which only moves 100 miles, other conditions being the same.

2. When the lay of the land is the same, distance is the chief factor, but otherwise *grades* and *curves* may make an important difference in operating expense.[1]

3. The *amount of switching and terminal service* is sometimes an important consideration in rate making which can be rather definitely allowed for; and switching and terminal charges have been given increasing importance in rate cases. Such charges can often be assigned to given localities or to different kinds of traffic.

4. Obviously, the *size and weight* of the shipment have something to do with the minimum expense, and an article which weighs twice as much or is twice as bulky as another must involve more expense to the carriers, other things being equal.

5. The *loading characteristics* of various commodities differ widely, it being possible to make up heavy carloads of some, while others furnish lighter loads. The unit expense of hauling partly loaded cars or commodities which cannot furnish a heavy minimum car loading is relatively great and this is considered by the carriers in making rates.

6. *Risk* is another matter in which different classes of traffic show definite differences, and by experience it may well be determined that the average payment of loss and damage claims per unit of one kind of commodity is twice as great as per unit of another kind.

7. Some commodities require box cars while others may be moved in open cars or on flat cars. The *kind of car* required affects the supply price of transportation.

8. There is also the matter of the *special service* which

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[1] See above, page 11*f*.

may be required. Some commodities must be moved at special speeds in order to make the market, as is the case with perishables and livestock; other commodities require special protective service, either in the way of refrigeration during hot weather or protection from cold during the winter. The special charges required for such service can be fairly well allocated and assigned to the particular commodities or group of commodities for the benefit of which they are performed.

9. *Direction of traffic* is sometimes a dominant consideration in the carriers' supply price, the most common point being that goods which move in the opposite direction from the prevailing traffic can help to fill empty back-haul cars. Railways have sometimes gone to great lengths in making low rates for the purpose of developing back-haul traffic.

Decreasing Cost.—The foregoing factors affecting expense are the most important and reduce to the smallest number the points that a railway traffic manager would have to consider in determining what minimum charge he would have to make for hauling any particular commodity.

There is one other consideration, however, which is of equal importance, and which applies to all kinds of traffic regardless of distance, special service, etc. This is the volume of traffic. Within limits, the railway business is subject to the law of decreasing unit costs, and within those limits the greater the volume of the traffic, the lower the cost per unit. It follows that a railway may make rates which, on the basis of an existing traffic, are less than cost if it is sure that under the low rates the business will develop in such volume as to reduce costs within a reasonable time. For example, low rates have been made on coke for the purpose of encouraging the steel business and thus bringing a profit to the carriers from the increased steel tonnage. This is a delicate consideration and obviously may be made the ground for discrimination in rates. At least, it is easily possible to be mistaken about the future development of traffic. Also, it may be forgotten that when traffic grows beyond certain limits, there must come an increase in plant or a change in organization which will result in increased expense. Nevertheless, if wisely administered, railways can, and under free competition would, make their rates with a view to the law of decreasing cost.

Two illustrations may be given of the way in which increased volume of traffic affects operating expenses, and consequently, the railway's marginal supply price of transportation.

In the first place, there is a difference in the size of individual shipments as regards the extent to which they utilize car space. It is largely on this basis that there is such a difference between carload and less-than-carload ratings. The relatively small less-than-carload shipments have to be consolidated to make up a carload, which means extra handling and risk; but more than that, they cannot be made into such large carloads as is the case with "carload freight," partly because the different shipments have to be taken out of the car at different points. Accordingly, the minimum rate that can be charged by a railway would be lower in the case of shipments which would move in carload lots.

The second way in which volume of traffic is important concerns the regularity and quantity of freight supplied at a given point or within a given territory, and destined for a single point or group of points. The bituminous coal roads derive a large and steady volume of traffic from the West Virginia mines and on that account can afford to haul that traffic at low rates. Indeed, they make large profits in spite of their empty back hauls. There is no question of carload versus less-than-carload freight here; but the point is that the cars are heavily loaded and are available in such trainloads that the locomotives can be used to their full tractive power without delay. The grain traffic of the Granger roads and the Trunk Lines furnishes an illustration of economy arising from volume of traffic, but here the volume is not sufficiently continuous throughout the year to be most desirable, and alternate car surpluses and shortages are likely to arise. On the other hand, the New England railways, with their small carloads and trainloads, and their short hauls of diversified freight, illustrate the relative disadvantages not only of less-than-carload freight but also of small total volume of traffic.

Summary of Demand and Supply Factors.—If the foregoing analysis of demand and supply factors is adequate, we may now sum them up as follows:

Chief Factors Affecting Demand for and Supply of Railway Transportation

Shippers' Demand Price Factors:

1. Shippers' margin of gain
2. Specific value of commodity
3. Perishability and storability of commodity
4. Existence of substitutes
5. Competition among shippers

Carriers' Supply Price Factors:

1. Maximum limited only by marginal demand price.
2. Minimum equals specific cost; is dependent on
   - (a) Distance
   - (b) Direction
   - (c) Bulk and weight
   - (d) Risk
   - (e) Special service
3. Law of decreasing cost
   - (a) Size of shipment
   - (b) Volume of traffic between given points

Locating the Rate between Maximum and Minimum Points.—It will be apparent that the closest analysis of the demand and supply conditions affecting railway rates brings us only to a point at which we can fix a definite demand price, but are confronted by a range of possible supply prices between a maximum and a minimum. The situation is something like that shown in the diagram in Fig. 19.

The curve *DD′* represents shippers' demand price for transportation, and the curves *SS* and *S′S′* the series of carriers' maximum and minimum (marginal) supply prices, respectively. Where the railway rate will be determined and equilibration between a marginal demand price and a marginal supply price occur cannot definitely be stated. The most that can be said is that the point must lie between *R* and *R′*, the points at which the demand curve crosses the two supply price curves.

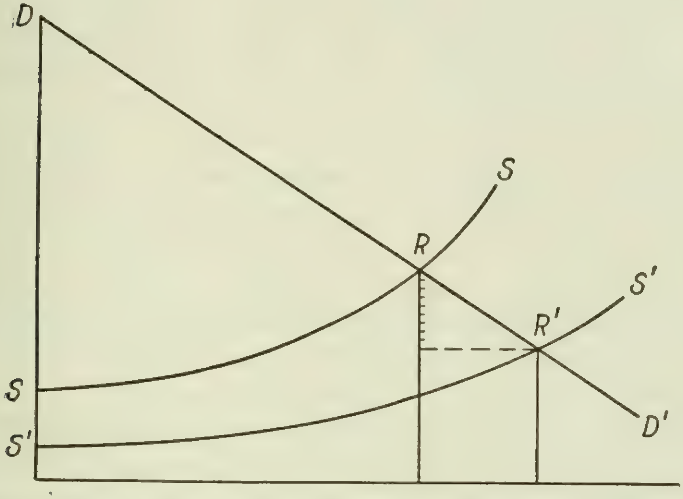

Fig. 19.—Diagram showing Bases for Maximum and Minimum Rates

The crucial problem, then, in the determination of railway rates lies just here. It is possible in principle to determine a minimum basis of rates and also a maximum, but where should the exact rate lie between these two points? It seems that the only answer to the question is that the precise rate to be charged must depend upon the intensity of the demand for the transportation of the particular commodity involved, and it is suggested that it is both consistent with actual railway practice and with the sound interest of the government in regulating railway rates to determine how much of the difference between maximum and minimum charges should be borne by each item of traffic by considering the scale of demand prices. To this extent we fall back on the element of truth which is in the minds of those who say that rates should be made on the basis of "what the traffic will bear." But we have maximum and minimum limits, and we now have a definite conception of how the bearing power of traffic is to be determined.

Relative vs. Absolute Reasonableness of Rates.—This seems to be the point at which to bring in the idea of the contrast between relative reasonableness and absolute reasonableness in making rates. An absolutely reasonable rate would be one which in itself, without regard to others, would satisfy all tests of reasonableness, and the general conception of such a rate would be one that would yield a fair return on the investment. It would, therefore, have to bear a pro rata share of net earnings. Obviously, such a conception is only applicable when expenses can be definitely assigned to each paying unit. As a matter of fact, therefore, the conception of *absolute* reasonableness is of little practical importance in the railway business in so far as particular rates are concerned. It finds expression as to particular rates only in setting certain limits —a maximum determined by demand and a minimum set by specific cost. These limits may be said to be absolute; and, to the extent that they approach one another and the margin between them is narrow, the determination of the particular rate approaches the level of absolute reasonableness.

The great mass of rates, however, fall between the maximum and minimum points, and are only subject to the rule of *relative* reasonableness. Some years ago a committee of the Senate, commenting on the decisions of the Interstate Commerce Commission, reported that, "Each complaint has always left unchallenged some of the rates made by the same carriers, and the idea of comparison between the rates questioned and others, argumentatively at least, admitted to be reasonable has always been prominent." The report adds, "In fact, even in the few cases in which charges have been declared excessive in themselves by the Commission (no such finding has ever been made by a Federal court) the tests applied have invariably been comparative."[2] It is thus apparent that the basis for deciding what proportion of the joint expenses and necessary return on investment should be borne by the various particular commodities or classes of traffic is of the utmost importance. This is the question of relative reasonableness.

Relative Demand and Expense a Basis for Grading Rates between Maximum and Minimum Points.—The first proposal here made is that the relative intensity of demand be made the basis for determining the relative reasonableness of rates. This basis should be supplemented, however, by considering in each case the relative expense of the transportation service. Just as we can generally know that the demand for some particular transportation service is greater than that for some other service, so we can generally know that the cost of any particular service is somewhat greater or somewhat less than that of another service. Reference to the nine expense factors listed on page 221 will make this statement somewhat more comprehensible. Take distance, for example. If in any particular case the transportation services are virtually the same except that the distance varies, it can readily be stated that the cost of any particular service is greater or less than that of some other service, and possibly also the amount of the difference can be specified. If one commodity requires protective service while another does not, it can be said that the cost of transporting the former is relatively great. In this way, commodities can be ranged in a relative scale as to expense, and this scale of relative expense can be compared with the scale of relative demand intensity. On the basis of these scales the sum of the joint costs and return on investment can be allocated to each item of traffic on a *relatively* reasonable basis.

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[2] Digest of Senate Hearing on Rate Regulation, 1906, page 25.

Principles Formulated by the Commission.—This appears to be as precise a formulation of the economic principle of railway rate making as can be given. A study of the Interstate Commerce Commission decisions will demonstrate that in an unsystematic way that body has followed a course similar to the one outlined above. The Commission has said that in determining a reasonable rate it takes into consideration the following points:

1. The earnings and operating expenses.
2. The rates on the same commodity on similar roads.
3. The relative quantity of through and local traffic.
4. The proportion of the particular commodity to the remainder of its class of traffic (through or local).
5. The market value of the commodity.
6. Change in the price of articles entering into the cost of producing the commodity.
7. All circumstances affecting the traffic.

In another place the Commission has said that it will consider the history of the rate, the reason for its establishment, the nature of the traffic, and the competition between shippers and communities, and "all other pertinent evidence." We see in these statements an emphasis of the problem of relative reasonableness of rates and a vague general sense of the idea that relative reasonableness will be based on various factors affecting demand and supply prices as analyzed in the foregoing pages. Also we note that there is the idea of an absolute minimum set by operating expenses.

Final Scheme of Rate Determination.—The way that the matter of rate determination would work would be somewhat as follows. Starting with the total operating expense of the railway, we assign, as nearly as possible, all the expenses which are attributable to the freight service. A part of these expenses—it cannot be said what percentage—are both variable and specifically assignable to different classes of freight. At least, there is such a logical relation between the variation of certain expenses and the volume of traffic that there is no more reasonable basis than that of charging the traffic with such expenses. These specific expenses constitute a bare minimum.

The problem now is to know what to do with that large portion of expense which cannot be specifically assigned. We know that it is caused by the movement of freight and must be paid out of the receipts from freight; but that is all. What we propose to do is to determine the demand for transportation so that it can give us a reasonably precise basis for determining what each item of freight traffic should bear—by "should bear" meaning what is economically expedient. The relative demand should be supplemented by a consideration of relative expense.

Accordingly, our next step is to ascertain as exactly as possible the facts with regard to the factors affecting shippers' demand price, and on that basis to determine how much of the joint expenses should be borne by each commodity. This procedure is roughly illustrated by the diagram in Fig. 20. Points on the line *DD'* represent a series of shippers' marginal demand prices for the transportation of all the various commodities that move by railway freight. At the high point of the curve fall those commodities for which the shippers' demand is most intense. They depend upon the various considerations mentioned on pages 209-217. The irregular line *Sc* represents the carriers' minimum supply prices based on specific costs. These supply prices are definite, but do not have any relation to the shippers' demand price. They are absolute quantities.

It would appear to be true, however, that the commodities having higher specific values, which chiefly fall in the upper

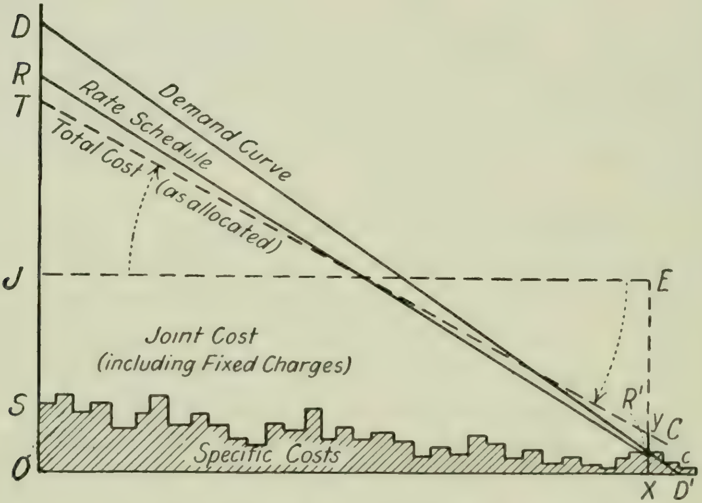

Fig. 20.—Diagram illustrating the Determination of Particular Rates and the Allocation of Joint Expense according to Demand

range of the demand price group, are also the ones which move in smaller volume, require more special service, etc., and consequently, the general trend of the line *Sc*, is similar to that of the line *DD'*.

The line *JE* represents the large element of fixed and other joint railway expenses. This line is horizontal for the reason that the expenses it represents are either fixed, or, if variable, do not vary with definite relation to the volume of any particular kind of traffic. These expenses are apportioned to the different commodities on the basis of demand, and consequently the line *JE* tends to take a course like the dotted line *TC*. The minimum rate to be charged, therefore, on any particular kind of traffic is to be found by adding to the specific cost of that traffic, represented by its point on the line *Sc,* its share joint costs. This share will depend on demand. Traffic falling in the left half of the diagram where the demand curve is high will bear a larger share of the joint costs—a share greater than the distance from the base line of the diagram to the line *JE*. The line *TC* is the result of apportioning the joint expenses according to the demand for transportation (or the ability of the traffic to bear transportation charges), and represents the sum of specific costs and the share of joint expenses as assigned to the various kinds of traffic. Thus the area *OTYX* represents the total operating expenses of the railway. It is the sum of the two areas *OSX* (specific costs) and *OJEX* (joint expenses). The line *TC* is drawn arbitrarily, and its course is necessarily indeterminate, except that we know that it must tend to follow the course of the line *DD′* and cannot lie above *DD′* to any great extent. (It is affected by relative expense of service, a factor which does not lend itself to graphic portrayal.)

The line *RR′* represents the railways' schedules of rates, and the area *ORR′X* the total revenue from rates. The line *RR′* reaches a minimum where it intersects the specific cost line at *R′*. At no point can it be higher than the demand line *DD′*. Where it lies above the line *TC,* there is a profit for the railway, both in the sense that the rate exceeds the average total cost and that it exceeds the average total cost plus a share of the joint expenses assigned on the basis of demand. Where the rate line *RR′* lies below the line *TC,* there is a loss to the railway in the sense that the traffic concerned does not pay its share of joint expense.

CHAPTER XV

GENERAL LEVEL OF RATES AND SUMMARY

The Problem.—The two foregoing chapters have dealt with the determination of particular railway rates—the rates to be charged for the transportation of any particular item of traffic. We have seen that a large part of the total revenue of a railway must be raised by assigning to particular rates their relative shares of joint expense and contributions towards return on investment. The question, therefore, which now confronts us is that of determining both (1) the amount of the total revenue, and (2) the amount of the total return on investment, which are required. (The amount of the joint expense can be known from the accounts now kept by the carriers.) These total amounts are, as it were, the controlling accounts. They are, respectively, the total sum which must be realized from the various particular rates and the total charge against rates which must be made to cover operating expenses and return on investment.

It will be helpful from this point of view to regard the nation as a unit and to consider it as having a demand for railway transportation as a whole. The people of the country demand service of railways, and they must pay those who construct and operate railways for that service. Immediately, their payment takes the shape of particular rates paid for the transportation of wheat, shoes, coal, lumber, etc., between particular points. Ultimately, their payment is the compensation for all the labor, capital, and business enterprise which go into the construction, maintenance, and operation of the railways. This total payment depends upon the general level of rates. Thus the general rate level involves a comparison of the income of the railways of the country, regarded as a single system, with their total expenses; and the profitableness of the railway business and the credit of the carriers are dependent upon it.

Relation between General and Particular Rates.—The connection between particular rates and the general level of all rates is fairly obvious. All the particular rates, taken together, must, when applied to the traffic which moves under them, make a general level of gross revenue which will enable the construction and operation of socially desirable railways. If the general level of rates is too low, some or all of the particular rates must be raised, and vice versa. The general level of rates is an absolute thing based on the necessity of covering the expenses of construction and operation. The particular rates represent the distribution of the general rate level among particular items of traffic.

The General Demand for Transportation.—From the social point of view, the general level of rates involves the problem of demand and supply with regard to the railway facilities of the nation. On the one hand, the demand arises chiefly from the fact that commodities are wanted more intensely at some points than at others. The railways provide the means for connecting points of production or surplus supply with points of consumption or deficient supply. Also they serve to equalize population and investment by facilitating the movement of men and capital. Nor must we forget the political and military utility of the means of transportation which promote social intercourse and political integrity, while providing an essential agency of defense and offense for the nation. From these points of view it is clear that the people of a country have many and intense wants for railway transportation, which are only limited by the existence of other agencies, such as waterways and highways.

These wants for transportation are effective in the shape of "demand" to the extent that they are supported by the wealth and income of the nation, which provide the purchasing power. Today the people of Russia no doubt greatly desire improved transportation but the purchasing power is not there.

The Supply—Cost of Construction.—The supply of railway transportation is to some extent absolutely fixed by environment, depending upon the lay of the land, the supply of materials, etc. Generally, however, the supply of railways is only limited by expense, and there are two phases of expense to be considered from the point of view which we are now taking. These are the expense of construction and the expense of operation. Operating expenses have been considered in their relation to particular rates. It now remains to consider that part of operating expenses which is necessarily related to the general level of rates, but especially the cost of construction, upon which must, in the last analysis, depend investment and, in part, return upon investment.

Railways will not normally be built unless the total income, existing and anticipated, is in excess of the total expense. With private ownership and operation the income and expense must be measured in economic units and generally be expressed in terms of money. To use a common expression, it is "a dollars-and-cents proposition." To the extent that the government intervenes in the actual conduct of railway affairs, political values may be considered and be added to income or weighed against expense. Such values, however, are intangible and difficult to measure.

With the exception of political considerations, the average rate on all the traffic on all the roads of the nation—that is, the general rate level—must be such that multiplied by the total units of transportation service or traffic, the product, which is the total revenue, will at least equal total expenses, including a charge for the replacement of capital and a return on investment.

The Determination of the General Level of Rates—Demand Indeterminate.—As already stated, the general level of rates must depend upon the demand for, and supply of, railway transportation in general. That is, the general rate level must bring a normal balance between supply and demand. The general demand for railway transportation depends upon the factors outlined above, but it is hardly possible to measure that demand. In fact, the demand for railways in general is a highly composite matter. The demand for coal mines depends upon the demand for coal; the demand for shoe factories depends upon the demand for shoes; but the demand for railways depends upon the demand for the transportation of thousands of particular commodities between thousands of different particular places. This is partly what makes the problem of the general level of rates difficult, and as a practical matter we are forced to go back to the particular demands for the transportation of various commodities and persons. Accordingly, demand is most important in the determination of particular rates.

Supply Side Most Important for General Level.—The supply of railways in general depends upon the cost of constructing and operating railways, and here the investment in railways is the one great item which requires consideration. The cost of constructing a single railway, or all the railways in the country, is the investment. Moreover, a part of the cost of operation depends upon the investment. The charge for depreciation and the replacement of capital is largely dependent upon the investment figure. The allowance to be made as interest on investment is also thus dependent. It follows, therefore, that the chief problem in determining the general rate level is the determination of investment.

This emphasizes cost, and it is true that cost is the chief factor in the determination of the general level of rates. It has been seen that in making particular rates, cost plays but a limited part. It is in connection with the general level that cost finds its full expression. When we say that rates must be such that they yield a fair return on investment, we are in effect saying that the general level of rates must be such that it will cover the cost of construction and operation together with a fair allowance for interest and profit.

How, then, shall the true investment in railways be determined? This is an old problem and one concerning which there has been much difference of opinion. Many legal decisions have been made concerning the matter. In the last analysis, however, the economist will have the deciding word —and it is from the economic point of view that we shall approach the question.

Basis for Determining Investment Cost.—In order to clear the ground, we must at once note three distinctions:

1. *Ethical and Legal Values vs. Economic Values.*—Purely economic value takes no account of right and wrong. For example, costs which have necessarily been incurred in the past construction of railways may have resulted in the existence of portions of plant or roadbed which do not now have an *economic* value equal to the cost. In such cases, it may be *ethically* just and in accord with the law that the investors should be allowed the value equal to the cost that was originally incurred. In this and similar cases non-economic values may be recognized, but should only be allowed after

distinct recognition of their non-economic character and careful scrutiny of the honesty and wisdom of the original investment.

2. *Competitive vs. Monopoly Values.*—Under competition market value normally equals expense plus a minimum return to capital and enterprise. It is based on the free play of demand and supply forces, and may be assumed to result in the maximum quantity of profitable business. Monopoly values, however, mean limited supply, and often are higher than the sum required to cover expenses and a minimum return to capital and enterprise. Accordingly, monopoly values have no ethical validity. We have seen that the railway business is, to a considerable extent, naturally monopolistic, and it is to be borne in mind that railway rates are not to be taken for granted as furnishing a fair basis for valuation.

3. *Private Gain vs. Public Utility.*—Unregulated competition cannot be trusted to work satisfactorily in public-utility businesses. We depend upon it to regulate industries in which private gain is the mainspring. In private industries, speculators and promoters are welcome and furnish a valuable part of the direction of competition; but in public-utility industries, such as railways are, where the product is vitally essential to social welfare, the investor and the conservative manager are more important than the speculator and the promoter. Accordingly, there is less desirability for fluctuation in values and wide margins of profit.

In view of these three points, we may now pass judgment upon several theories of valuation which have been proposed as a basis for determining the true investment.

1. "Earning Capacity" and "Present Value."—For those who are used to reasoning concerning competitive and private-gain values, it is natural to propose that the value of the investment of the railways should be determined by taking the market value based upon their earning capacity. A moment's reflection, however, will show that for rate-making purposes such a basis of valuation is doubly bad. In the first place, earning capacity partly depends upon gross earnings, which, in turn, depend upon the general level of rates. To take an investment figure based upon rates for the purpose of determining the reasonableness of rates is to reason in a circle.

In the second place, the earning capacity is partly dependent upon the amount of the operating expenses which must be deducted from the gross revenue to arrive at the net. But these operating expenses partly depend upon the railway's investment. This is true of depreciation charges. For rate-making purposes the railway plant cannot be taken for granted, but, as we shall see, the honesty and efficiency of the construction of the plant must be considered, to say nothing of its social utility. In short, the "earning capacity" theory begs the question of the valuation for rate-making purposes by assuming a certain rate level and a certain level of capital replacement charges, such as depreciation.

When the question is merely one of condemnation or sale of a railway property, the market value based on net earnings may properly be used; but even there the wise investor would have to consider the possibility that the government might step in and regulate rates and accounting methods in such a way as to reduce the earning capacity and the value of the investment.

2. "Cost of Reproduction" or "Cost of Duplication."— Some public service commissions and several court decisions have adopted cost of reproduction as a basis for determining the true investment of a public utility. This proposal is one that is very commonly made and which will require the most careful study. The cost of reproduction may have either one of two meanings. It may mean the cost of the identical plant; or the cost of a plant which is equally efficient, but one which may differ more or less in form and arrangement from the existing one. Also, the cost of reproduction may mean either the cost of a new plant or the cost of the existing plant as depreciated. This is not the place to go into details connected with these various meanings, but it is merely pointed out that the conception of "cost of reproduction" is not a clear-cut one and requires accurate definition. Without reference to the various shades of meaning let us examine this general basis.

Question of Unit Costs.—Perhaps the first question to arise in one's mind is what unit prices should be taken as the basis for determining the cost of reproducing a railway plant. Shall we take current prices or those which were originally paid? Shall we take the prices of any one year, or of a series of years? Perhaps some fair basis could be arrived at in each particular case, but it can readily be seen that the procedure must be more or less arbitrary. Particularly difficult is the case of real estate. It has been proposed to base the prices of land to be allowed in determining the cost of reproducing a railway upon the value of abutting land. In many cases, however, this would not be fair to the carriers, as railways frequently have to pay "hold-up values" for real estate. In Wisconsin, for example, it was found that railways paid for land over 300% more than the consideration shown in the records of the registrar of deeds. The conclusion must be that the determination of unit prices presents great practical difficulties.

Question of Necessary Original Costs.—The second question to arise in considering cost of reproduction concerns the allowance to be made for the costs which were originally incurred. Some of the original costs may have been necessary and incurred with all honesty and wisdom, yet they would not be necessary in reproducing the plant. Grades, perhaps required by law, once made need not be made over again, but should the cost not be allowed in investment? Moreover, the cost-of-reproduction basis might cause unjust risk to investors, since valuations made in periods of relatively low prices would result in investment figures which would be unfair. To take the average price for a series of years would be tantamount to an abandonment of the cost of reproduction principle. There are "starting expenses" which are necessary to create and develop traffic. There are certain organization and legal expenses which are required at the beginning of an enterprise. There are the risks of a new enterprise for which the enterprisers deserve rewards—rewards for plans and foresight. The conclusion must be that cost of reproduction would not make due allowance for all the necessary original expenses.

Intangible Items Not Covered.—Under the cost of reproduction theory, how would allowance be made for intangible items of property value? There are important items in a railway's investment account which would not find expression in any costs of *reproducing* the plant. One of the most important of these items is the "seasoning" of the roadbed. There are changes in alignment, restoring washed banks, rebuilding after wash outs, and raising roadbed and track. On such operations thousands of dollars per mile of line may have been expended, yet they would not be required in reproducing the plant. The National Association of Railway Commissioners has said, "There is an appreciation in the value of the roadbed due to what is termed 'seasoning,' the settling of embankments requiring a filling in to bring up to required grade and width, clearing out and widening cuts, etc., which require an unusual expenditure during the first few years, all of which adds to the value of the roadbed and must be taken into consideration in the valuation."[1]

Then there is the intangible item of "going value." This represents necessary expenses incurred in building up the business so that it will pay more than operating expenses, including depreciation and fixed charges, and will yield a normal profit to cover the risk of the enterprise. An established railway is worth more than the cost of the various separate parts, and anyone choosing between the cost of reconstructing a new line or buying an old one would pay more for the latter. Here again, cost of reproduction does not allow for an important intangible asset which should be recognized from the social point of view.

Conclusion on Cost of Reproduction.—In short, the cost of reproduction is neither what was honestly and wisely paid by the original investors, nor what new investors would be willing to give for the property with its various intangible items of value and its established business. To cap the climax, it furnishes a one-sided theory of valuation, for it gives no consideration to the social utility of the railways. It is not actual cost; nor is it justified by any consideration of demand.

It, therefore, seems that economists must support the utterance of Judge McCormick, who, in *Metropolitan Trust Company v. Houston and Texas Central,* said: "A system of rates and charges that looks to a valuation fixed on so narrow a basis as that shown to have been adopted by the Commission, and so fixed as to return only a fair profit on that valuation, and which permits no account for betterments made necessary by the growth of trade, seems to many to come clearly within the provision of the 14th amendment." (The 14th amendment prohibits the confiscation of property without due process of law.)

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[1] Report of 1910, page 142.

3. **Original Cost.**—The third chief method of determining the value of the railway's investment is that which is based on original cost including all additions and betterments. The original cost would include the actual expense of all steps necessary to the development of the present efficient service of a railway, from the necessary "starting expenses" which were honestly and wisely made, down to the latest expenses for bringing the roadbed up to required grade and width. Original cost is something actual. It is not a hypothetical thing, but is the sum of expenses actually incurred. It has a basis in history and is a record of the facts attending the development of the property. More than that, it allows due regard for ethical considerations, for under it the appraiser should take up the question of risks and obstacles which were confronted in starting the enterprise. It considers the whole life of the plant, and therefore, makes it logical to take account of the relation of the plant to the future.

Before passing final judgment on this basis of valuation, let us consider how it would be applied. In the first place, the tangible physical items of the investment would be covered by going into the actual construction records wherever possible. It has been found in practice that field surveys made for determining cost of reproduction are frequently inaccurate, as original ground lines change, bridge piers cannot be seen, etc., etc. Consequently, the only accurate way to proceed is to take the records of actual construction. When these are not available, of course, it is necessary to make surveys to determine the work done and to apply the unit price which prevailed at the time of construction.

As to intangible items, under the original cost method the appraiser must consider the legitimate promotion expenses, including organization and legal expenses and discounts on securities when these are honest and reasonable. The economist would be the last to deny the justice and expediency of allowing compensation for business plans and foresight. Interest on investment prior to the receipt of profits would be allowed. Freight on construction materials would be another legitimate item.

"Going value" is not to be allowed in the sense of a "value of created income," for the reason that income comes from rates and rates cannot be assumed when we are determining a valuation for the purpose of making rates. *But in another sense, going value must be allowed for.* A railway plant must have cost more as a going concern than the sum of its separate parts. A working organization has been built up partly as the result of legitimate advertising which may be both educative and productive. There are expenses involved in getting business; there are early losses and operating deficits to be covered.

Differential Advantage.—Is there any other element in the investment account of a railway which must be included in order to arrive at a fair basis for determining a reasonable general level of rates? Does the original cost basis as briefly outlined in the foregoing paragraphs cover all items of investment upon which the investors in a railway are entitled to a return? It appears that all the many parts of the construction, maintenance, and operation of the railways would be provided for, but there is one item which no cost figures would cover. This is the valuation of the differential advantage which some carriers possess on account of superior location. Between Chicago and New York there are several lines of railway, no two of which are equally advantageous. One of the roads must have the highest cost per ton-mile in hauling goods between those points, and another must have the lowest. In spite of this difference in cost, practically but one rate can be charged for hauling the same commodity between those points, and it follows that the road with the minimum cost must make a larger profit than the roads having higher costs. This higher profit, *in so far as it is due to the natural advantages of route,* is a measure of what is known as the differential advantage. It is closely similar to what economists call rent.

It may be argued that this differential advantage is not a thing in which a railway should have property rights—that no private property is entitled to capitalize the amount of the differential profit. But as long as we have private property, it is difficult to say how we could do anything else but include the capitalized value of the differential advantage in the valuation of the carriers' investment. The expenses of the least advantageously located road must be allowed for if we are to assume the various lines to be necessary. These expenses include not only the original cost of investment, but the greater operating expenses caused by the natural disadvantages of the marginal road. There must be a single rate and there results a permanent differential advantage. So long as we allow individual land owners to enjoy the increased values which result from superior location, we can but allow the carriers to do the same.

Such an allowance, however, has no practical bearing upon rates. The general level of rates must be determined with reference to the least advantageous one of the carriers which is socially desirable, and must cover the highest costs which are socially necessary. Rates, in other words, are determined with reference to the marginal costs, and it follows that the differential advantage of the more advantageously located railways is a *result* of their superior location and has no causal effect upon rates.

Franchise Values.—A few special problems arise in the application of the original cost basis of valuation. Thus, there is the much mooted question of *franchise values.* Should a railway's investment account include an item which may be called "value of franchise"? From the point of view of valuation for rate making—which, it will be remembered, is widely different from valuation for sale or taxation—the answer must be in the negative. The value of the franchise comes from the railway's net earnings, which, in turn, depend largely upon rates. Thus, the same objection applies to the inclusion of the franchise item that applies to the earning capacity basis. Certainly, the franchise value is not based on cost.

Closely related to the franchise idea, is that of *public aid.* Many railways have received large grants of land and have been assisted in other ways. Such items do not represent cost, but are gifts of the public, and the public should not be asked to pay rates required to yield a profit on its gift.

Goodwill.—There are those who have advocated the inclusion of *goodwill* in railway valuations. In a competitive, private-gain business there might be some excuse for this procedure, although even in such business the item would be regarded with suspicion. In the railway business, goodwill cannot properly be included in the investment account. In the first place, it is a competitive factor based on the idea that consumers have a choice, and that the possession of their patronage is therefore an asset. A railway is a partial monopoly, and is obviously so for most local traffic. Accordingly, the conception of goodwill does not properly apply to any great extent in the railway business. In the second place, goodwill is not permanent or certain enough to be capitalized and made the basis of stable rates. This is especially true of a permanent public utility like the railway. In any case, goodwill is not a social cost, but merely represents competitive advantage. It is what economists call an acquisitive advantage. We must, therefore, dismiss it from consideration as a part of the true investment of a railway.

The upshot of this examination of the bases of valuation is that original cost as here outlined furnishes the true test.

In the case of roads which are advantageously located, however, there must be added an allowance to cover the value of their differential advantage.

Necessity of Applying Costs Honestly and Wisely.—It will have been noted that at several points in the foregoing discussion the idea of cost, or expense, has been qualified by using the words "honest" and "wise," or their equivalents. The courts have indicated that costs are only admissible as the basis for valuation for rate-making purposes when they have been incurred by an honest and efficient management. For example, in the *Wellman case* (143 U.S.) it was stated that if the court were fully advised as to the disposal of earnings, "it might clearly appear that a prudent and honest management would, within the rates prescribed, secure to the bondholders their interest and to the stockholders reasonable dividends."

This intimates that expenses which are imprudently or dishonestly made should not be recognized. It is safe to say that a "reasonable" original cost could not include either an exorbitant promoter's fee or an item of "interest on investment before profits" which covered an unreasonably long period. There would be a limit to the payment of extraordinarily large salaries. Expenses incurred for the purchase of property which is not reasonably necessary or advantageous for the conduct of the business might be disallowed.[2]

Another case in which the idea appears, although the faulty cost of reproduction basis is taken, is that of *Steenerson v. Great Northern* (72 N. W. Reporter 713):

> If a railway is built and operated wisely and economically, if it is located where public need requires it, where there is business to justify its existence, and constructed so as to be fit and well adapted for the business which it aims to accommodate—it should be entitled to return as good interest on

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[2] On this point see *Capital City Gas Light Co. v. City of Des Moines.*

> the cost of the reproduction of the road as capital invested in the average of other lines of enterprise.

Thus the original cost idea is modified to mean original cost to the extent that such cost has been honestly and wisely incurred.

To sum up, the test of a true economic valuation of railway investment is really twofold. On the one hand, it must be sufficient to cover all original costs; on the other hand, only such investments should be recognized as are made in railways which are honestly and wisely built.

The Transportation Act.—It is in keeping with this principle that the Transportation Act of 1920 gives the Interstate Commerce Commission complete power to regulate the construction and capitalization of railways. From now on, new construction must be authorized by the Commission, and the Act provides that no interstate carrier shall build any new line without first obtaining a certificate that the present or future public convenience and necessity require such construction. Capitalization, too, while a different matter from "capital," is closely related thereto and affects investment. The Commission now has practically complete control over it. Thus the government has at last stepped in to insure that only honest and wise investments shall be made in the railway business.[3]

Harmonizing Uniform Rates with Diverse Costs.—Thus far this chapter may be briefly summed up in the conclusion that the general level of rates, as distinguished from particular rates, depends chiefly upon the investment in railways and that the investment is to be determined by the amount of those original costs which are honestly and wisely incurred. It remains to show how the general level of rates is related to the rates of the different sections of the country or different railway systems; for, while a conception of a general level is real and helpful, it is nevertheless true that in practice the general level is distributed among roads whose original costs vary widely. Indeed, investments in the different parts of a single railway system may show the greatest dissimilarity. Naturally, then, the question arises, If the general level of rates is based on original cost of investment, how can there be any uniformity in rates among the different roads or on different parts of the same road?

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[3] See below, page 544.

We can dismiss at once the cases in which the general level of rates does not cover costs even indirectly or in the long run. The costs of such railways mean that investments have been made which are unwise or inefficient, and these investments must be liquidated on the basis of the general level of rates. The remaining cases all fall into two groups: (1) those roads whose original costs are directly compensated or more than compensated by the general level of rates, and (2) those roads whose costs are only indirectly covered in the long run. It is concerning the latter group that the question arises.

Branch Lines.—The distribution of charges need not be uniform in proportion to investment. If it is clear that indirectly or in the long run the aggregate cost of a railway system *as a whole* is being compensated by the general rate level, without there being any net loss, then certain parts of the system may be operated with economic advantage even though the rates directly assignable to them do not yield a return on the cost of investment in those parts. Take branch lines or feeders, for example. If the greater volume of traffic which they bring to the main lines with which they are connected enables a reduction in the average operating expense per ton-mile on the main line, the amount of the reduction—and the gain arising therefrom—may be imputed to the branch line and be offset against its cost.

This reasoning, however, must not be overworked. It is sound economics to conclude that the *local* traffic of the branch line ought to be separately considered, and be made to pay its specific costs and something towards the general expenses which are assignable to the branch line. To this extent the branch should "stand on its own bottom."

This raises the question of the practicability of imputing gain to a non-profitable line. The only costs known are totals covering both local and through traffic. We know the total costs on the unprofitable branch line; also its total income, and the total amount of its loss. But can we figure the offsetting gain to the other lines from the through traffic which it brings to them? If the only change resulting from the construction of the branch line were increased volume of traffic to the main line, the reduction in the average expense per ton-mile on the main line would measure the gain. But besides the through traffic which moves from the branch line to the main line, there is the local traffic of the branch line to be considered. This local traffic should at least pay its special costs and contribute something towards the general expenses of the branch line. Here comes the difficulty of determining the net gain from maintaining the branch. It seems a practical impossibility to determine separately for the local traffic its revenue and expense and loss. If this can be done, however, and only the loss of the branch on the through traffic is charged against the gain made by the main line, the arrangement in question can be fairly tested. Only as the local traffic of the branch pays for itself, while the gain of the main line on traffic interchanged is greater than the cost chargeable to that through traffic, is the arrangement economically sound.

Differential Lines.—There is also the problem of "differential lines"—that is, independent lines which are relatively weak or disadvantageously located—which raises the question, Is the same general level of rates to be charged on different competing lines in spite of their different costs? It has been maintained by some that one transportation route should never be allowed to take from another, merely as a consequence of competition, traffic which that other route could carry at less expense. The Grand Trunk, for example, it has been held, should not be allowed to take freight from Chicago to Boston which the New York Central could haul more cheaply.

In this argument there is an element of truth and also an element of error. It is true that the increased average cost per ton-mile which would result from the participation of the circuitous route would have to be considered and weighed against any advantages arising from such participation. The greater expenses set a limit and must be carefully considered. But it is nevertheless also true that there are certain advantages which may arise from allowing the more disadvantageously located road to share in the traffic. The Interstate Commerce Commission has said that "to decree that traffic should always move by the cheapest road would be to entirely eliminate competition, which, within reasonable bounds, is for the interest of the general public." There is undoubtedly a certain kind of competition in service and between markets which it is desirable to foster and which requires the existence of alternative routes. Furthermore, it is to be recognized that allowing the relatively inefficient carrier to participate in moving the traffic may cause a reduction in the average ton-mile expense of that carrier by giving it the volume required for its most economical operation.

As a rule, however, it would probably be found that it is most economical to let the carrier which operates at the least expense take all the traffic which it can accommodate. A good many thinkers have concluded that there are too many railway lines in some parts of the country. It is hardly practicable to compel an inefficient carrier to forego competition for traffic; but we can refuse to recognize its high costs as a factor in determining rates except to the extent that it is required to handle the traffic.

Different Classes of Traffic and the General Level of Rates.—A group of questions similar to the foregoing applies to the relation between the general level of rates and the charges to be made for different classes of traffic. May the general level be maintained while some classes of traffic pay more than their pro rata share of the cost and others pay less? Here the problem of determining the general level of rates merges into that of particular rates.

We have seen that it is economically expedient under some circumstances that fixed and joint expenses should be distributed over the different items of traffic in proportion to the intensity of the demand for their transportation. Now, however, in the light of the discussion of the general level of rates, it can be seen that there is danger of going too far in this direction, and it will be well to note a series of limitations upon the discrimination that exists when one branch of traffic is charged more than its pro rata share of all operating expenses and fixed charges.

In the first place, it may be laid down as a general rule that, to the full extent that demand permits, all classes of traffic should in the long run bear their full pro rata share of all the expenses and charges necessary to replace, maintain, and operate the transportation agencies.

In the second place, there are unreasonable discriminations —discriminations among commodities, among shippers, and among places—and there is danger of placing an undue burden on some classes of traffic when other classes are hauled for less than the pro rata share of all expense.

In the third place, it seems that there is no logic in the idea that, because some traffic is developed earlier than other traffic, the latter should be regarded as a separate thing which is taken on for what it will bring merely as an adjunct to the original traffic. The plant exists for all the traffic, and if it must be enlarged, it is because the *total* traffic considered as a unit is too great to be handled by the original plant. There is no economic difference between the earlier and the later units.

In the fourth place, it must not be assumed that all traffic has to move and that if any part of it will not move at a rate sufficient to pay its full share of costs, the rate must be reduced. It may well be that society would be better off if some goods did not move at all—if the elimination of such traffic would enable the carriers to operate without loss. Certainly, this is true when the question is one concerning the transportation of goods to remote points which might be supplied more economically from nearby sources.

Finally, there is danger of maintaining a larger investment in railway facilities than is economical in order merely to accommodate non-profitable freight. One of the most plausible arguments in favor of ignoring cost in making different rates on different classes of traffic is to urge that, as a railway has unused track and equipment, it must take on additional traffic no matter how little it will pay, because such traffic will help defray the cost of maintaining the excess facilities. But, when confronted with this argument, we must distinguish two cases:

> 1. When the situation arises with regard to empty back hauls, seasonal surpluses of equipment, or the existence of reasonably anticipated growth in traffic, the argument may be sound, for in these cases the excess facilities are economically justified and the extra traffic really helps to pay necessary costs.
>
> 2. When, however, the excess of facilities arises from uneconomic construction or from the growth of superior competitive roads which have diverted traffic, the argument is not sound, for here the excess is not necessary

and the so-called fixed costs are not economically justified. A single railway ought not to maintain such equipment that it will be necessary to haul goods for less than cost in order to utilize its full capacity, and the same principle applies to the railways of a section or of the nation as a whole.

Summary.—To sum up, then, we conclude that discriminations in rates based on differences in demand, must be made, and that the general level of rates must be maintained by charging different particular rates on different classes of traffic; but that in making such discriminations cost cannot be ignored, and that as nearly as possible each railway and each class of traffic should be charged with its full pro rata share of all expenses, including capital charges. Thus, we bring together the discussion of particular rates and of the general level of rates.

Final Restatement of Principles of Rate Making.—It is now time to bring together in a concise way the chief factors which have been found to govern the determination of railway rates. This means the formulation of a theory of rates. The conclusion has been reached that particular rates and the general level of rates are determined as parts of the same process, which is the process of evaluating the transportation service. Through the necessity of maintaining the general level of rates the greater part of the cost of transportation exerts its influence upon particular rates; through particular rates the composite demand for the various particular services performed by the railways is brought to bear upon the general level of rates. On the one hand, *the cost factors which limit the supply of railway facilities are so largely joint that they can only be effective as regards the general level of rates,* and we have seen that the basis of determination for the general level is the original cost of investment when the investment is honestly and wisely made. On the other hand, *the demand for transportation service as a whole is merely the sum of thousands of particular demands, and is so composite a force that it can be brought to bear only through the particular demands which chiefly determine particular rates.* The whole scheme of rate determination may be expressed diagrammatically as shown in Fig. 21.

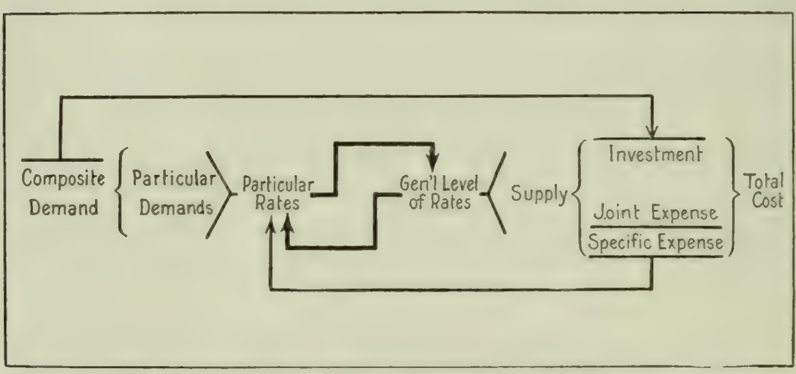

Fig. 21.—Diagram showing the Concurrent Determination of General Level of Rates and Particular Rates

The diagram, read from left to right, shows that composite demand through its component particular demands is brought to bear upon the determination of particular rates. At the same time it is set against the total cost of supplying transportation; and, particularly, the cost of investment must be weighed against that demand. Through particular rates demand is brought to bear upon the general level of rates, while at the same time the general level exercises a control over the sum of particular rates. This mutual action and reaction is expressed in the diagram by the two heavy arrows which connect the two phases of the rate structure. The supply of railway transportation is limited by the cost of investment and operating expenses, which together make up the total cost of constructing, maintaining, and operating the railways. The capital charges pertaining to the replacement and maintenance of investment items and the joint expenses can only be brought into relation with particular rates through the general level of rates. The specific expenses, however, which can be directly assigned to particular transportation services function directly and immediately in the determination of particular rates, as is indicated by the light line at the bottom of the diagram which connects the two.

If the reader has followed the reasoning in the chapters on Principles of Rate Making, it is unnecessary to go into further detail. Possibly, however, another way of summing up the complicated interaction of demand and supply may serve further to clarify the subject, though it does not add to nor alter in any way the foregoing statement of the case. Accordingly, there is presented next a diagram (Fig. 22) which serves to focus attention upon the problem of determining particular rates—the problem which arises most frequently in practice.

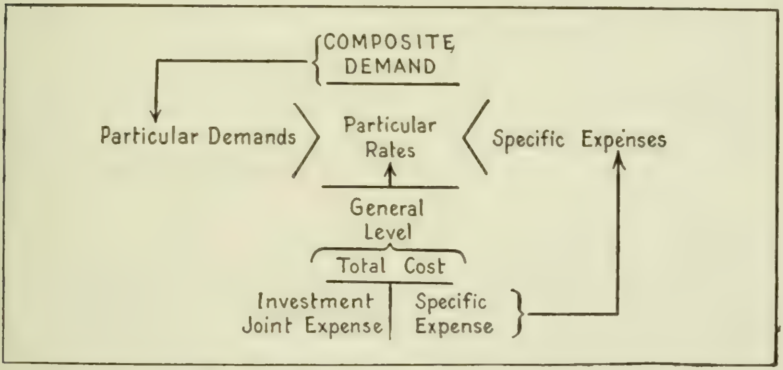

Fig. 22.—Diagram showing Determination of Particular Rates and Their Relation to the General Level

In this diagram we see expressed the idea that particular rates are determined between the level of composite demand and the general rate level. The former sets a broad general maximum; the latter, an equally broad and general minimum. Between the two lies the scale of particular class and commodity rates. The particular rate charged for each particular transportation service is immediately determined by the interaction of the particular demand for that service and the specific expense chargeable to it. This diagram brings out the fact that demand for railway service as a whole—the composite demand—is brought to bear on particular rates only in the shape of a particular demand for some given kind of transportation; while the only part of cost which functions immediately in the determination of particular rates is the expense specifically assignable to the particular service involved. *The total cost is the basis upon which must rest the general level of rates, and through the general level of rates it serves as a general controlling basis of particular rates.*

CHAPTER XVI

RAILWAY COMPETITION

Railways Partial Natural Monopolies.—In Chapter XIII it was said that railways are partially "natural monopolies," but this statement must not be taken to mean that there is no competition among them. It merely means that there is no continuous direct competition in making rates and that such competition in rates as exists is not effective in establishing and maintaining the lowest possible rates on every commodity. This fact is recognized by our legislation which provides, on the one hand, for close regulation of rates and, on the other hand, authorizes pooling and consolidation. Nevertheless, it might be more accurate to say that railways are natural *partial* monopolies, for it will be shown that there is some competition even in rates, and much competition in service.

Agency Rates.—It is often stated that railway rates are generally published by some agent representing an association of carriers and that this must mean that there is no competition. Even when published by an agent for an association, however, the rates, as published, are only arrived at after a clash of opinions and interests among the several members, which is a sort of competition; and when published they are not binding on the members. The rate-making procedure, under such circumstances, is not competition in the usual sense of the term, and common action so dulls the competitive struggle that we can have no assurance that the lowest possible rate will be established. It does not lead to the survival of the fittest. The point is merely that the clash of interests within an association of various railways, each one desiring the largest possible volume of traffic, is generally sufficient to insure against the exaction of the highest possible rates.

Illustration of Competition in Rates.—Within a single rate territory, such as the Trunk Line Association Territory, individual action is sometimes taken either by a single road or a group. For instance, in the fall of 1921, when the post-war readjustments in the iron and steel industry were being worked out, cuts in the rates on iron ore were made by individual carriers which precipitated a general reduction announced by the agent of the Trunk Line Association. The Chesapeake and Ohio, on September 22, made a 30% cut in the import rate on iron ore from Newport News to the Virginia furnaces. The Lehigh Valley followed in about a month with a cut of about 28% on ore from Perth Amboy, N. J., to Bethlehem, Pa., and on November 10, the Philadelphia and Reading reduced its ore rates from Philadelphia to Bethlehem by a similar amount. Meanwhile, the Eastern Trunk Lines as a body filed reduced rates on ex-lake ore in Official Classification Territory.

In 1922, a group of roads, comprising the Central of New Jersey, Lackawanna, Reading, and others, sought to make a reduction in the rate on cement from the Lehigh district to New York harbor for transshipment to New England points; while the cement interests of the Hudson district—a rival cement producing center—protested on the ground that the proposed reduction would put cement from the Lehigh district into New England on a basis too low relatively to the rates from the Hudson district. The Interstate Commerce Commission suspended the proposed rate.

But, while the so-called "differential roads" (which offer an inferior service at less than the standard rate) and the rail-water routes have offered direct competition in rates, it would be hard to find many cases of continuous competition among the railways serving two given points. Such cases as those mentioned are not only more or less sporadic, but they almost always involve different points of origin or destination and the competition among the railways is based upon competition among the different producing interests which they serve. As we have seen, when two or more railways operate between two given points, rate competition among them tends to become cutthroat, and hence is soon ended by agreement.

Three Kinds of Permanent Competition.—There are, however, at least three kinds of competition which have continued to exist down to the present time and which have a very considerable effect on railway rates: (1) competition among shippers, that is, market competition or commercial competition; (2) competition in service; (3) competition with other kinds of carrier. To some extent, also, railway transportation not under the jurisdiction of the Interstate Commerce Commission has been a competitive factor; such competitive transportation existing on Canadian railways and in the shape of intrastate traffic.[1]

Market Competition.—Probably the chief competitive factor in the railway business is that which arises from competition of markets. Let us be concrete by giving an illustration. Sugar is refined at various points in the United States, notably on the North Atlantic seaboard, in Louisiana, and on the Pacific Coast. There are also important beet sugar refiners in Colorado and Utah. These sugar refiners all desire to market their product throughout the Middle West, of which territory we may take Chicago as the center. A difference in price of one-tenth of a cent per pound is sufficient to make a decisive difference, and it is thus apparent that freight rates from the respective producing areas to Chicago are vital. The various railways serving the different producing territories must make rates which will allow them to compete in Chicago if those railways are to have any long-haul sugar traffic, and the adjustment of rates from rival points all over the United States into the central territory is a matter of keen competition.

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[1] See page 347.

In 1921 four large Eastern shippers complained of the rates on sugar to Chicago and Mississippi River points. This led to a conference of all traffic officers of the lines interested in sugar rates at which shippers and refiners were heard and the traffic men debated the situation, the great issue being the proper relation between the rates from the Atlantic seaboard and those from Louisiana. The Eastern lines proposed to cut their rate from 63 cents to 60 cents, which was the rate in force from New Orleans, but the Southern lines announced that if such a reduction were made, they would meet it by cutting their rate to 57 cents, and they argued that the possibility of shipping from the East by the rail-lake route justified them in demanding a 3-cent differential under the New York-Chicago rate. In the same year, the Transcontinental roads reduced the sugar rate to Chicago with the idea of restoring the old relation between the rates from California terminals and the New Orleans rate, according to which the former had been 25 cents over the latter. Then the inter-mountain beet sugar refiners raised an uproar and compelled the Transcontinental roads to extend the reduction to them. Of course, the Eastern and Gulf interests complained vigorously against the reduction. This whole situation, which may be considered as permanent, shows how the carriers are involved in the competition of growers, refiners, and jobbers, and how railway rates are affected throughout great areas by the competition of markets.

This is not direct competition between the carriers serving the same points. It is not a struggle between parallel railways. It is group competition. It is competition between manufacturing and commercial interests in which the carriers are involved in a supplementary way as agents. The competition among the railways is reflected from that among shippers, and the proposal for the introduction of lower rates often takes the form of complaints by shippers against the rates of the carriers which serve them.

"Adjustment" in Rates Caused by Market Competition.— The most notable characteristic of this market competition is that it centers in the matter of "rate adjustments" and that the railways are concerned not so much with making the lowest possible rate as with securing a relation between rates from different producing centers or to different markets which will enable the shippers whom they may serve to compete on equal terms. Thus, the roads serving the Louisiana refiners would doubtless have preferred to retain the 60-cent rate mentioned above, but they insisted on having a rate which was 3 cents lower than the rate from the Atlantic seaboard; while the Eastern carriers did not want to cut their rate on sugar to 60 cents but wanted the Southern roads to raise their rates to the 63-cent level.

Market competition cannot be counted on to establish the lowest possible rate but merely to equalize different markets. Nevertheless, we must recognize that the competition of markets is a great and fundamental force in making railway rates. Both the shippers and the carriers serving a given territory must often see that by reducing freight rates a larger volume of traffic can be moved, and it must often be the case that the shippers in one or the other of the rival producing centers will strive to enlarge their business by securing reduced rates, thus bringing about the same results as though the carriers which serve them were in direct competition with the carriers serving rival producing areas.

Above all, it is to be emphasized that this market competition keeps alive the economic test by asking the questions, Will it pay? Can the railways afford to grant reductions as requested? This keeps transportation on a business basis. It binds the manufacturer, the railway, and the dealer together in a cooperative business relation, and makes different railways or groups of railways as competitive as are the business interests whose products they transport.

Competition in Service.—Competition in service does not affect rates as such, but when a railway gives greater service at the same rate, it is virtually reducing rates, since it is giving the shipper more for his money.

The forms which this sort of competition takes have been numerous. Often the competition is most keen at terminals, where the carriers go beyond the mere operation of hauling the freight to their freight houses or public team tracks and give many special privileges to increase the attractiveness of their lines. Thus they seek to secure the most conveniently located spots for their terminals and extend those terminals to reach remote shippers. They "absorb" switching charges and give free cartage and storage. They go to great lengths in "spotting" cars for the convenience of carload shippers. They sometimes offer free store-door delivery. They give trap car service by which they collect cars full of less-than-carload shipments.[2] The privilege of offsetting demurrage debits with credits for prompt release of cars under the so-called average demurage agreement[3] is another special privilege developed by competition. In connection with the transportation of freight on the line haul many services are also given, such as milling and fabrication in transit and the privilege of reconsignment.

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[2] See page 492.

[3] See page 481*f*.

One of the most notable extensions of service under the urge of competition has been the establishment of merchandise cars which are run on schedule time between many important commercial centers, and the whole fast freight service with its "time" or "red ball" freight trains illustrates the same idea. Then, too, the carriers have vied with one another in furnishing equipment and refrigerator service. The development by the New York Central of the container car, and the move toward store-door delivery service taken by the Erie at New York, are special illustrations.

Importance of Service Competition.—All these services are expensive, and when they are given without a proportionate increase in rates, they are tantamount to rate reductions. Their importance is shown by the attitude of shippers during the period of government operation, when some of the special privileges which had existed under private operation were withdrawn or limited. Probably the chief ground for widespread complaint among shippers at that time was the absence of that competition in service.

The fact that service competition is closely connected with rates is demonstrated by the increased regulation of service by the government which has come of late years, being forced partly as a result of the narrower operating margins shown by the carriers and partly by the need of preventing discrimination. As rates declined or failed to advance with higher operating expenses, the extension of special privileges became more burdensome and was commented upon by those who opposed the railways' demand for higher rates, the point being made that by economizing in service the need for rate advances would be less. More and more, too, the Commission has found it necessary to make rulings against discrimination in service, and the Transportation Act of 1920 greatly increased the Commission's power over service matters.

Indeed, it is to be anticipated that just as the government was forced to exercise more and more control over rates on account of the unsatisfactory working of railway competition, so it will increasingly be drawn into the regulation of the special services performed by the carriers, and will thus come into closer touch with management. In a word, competition in service is so important and the chances for discrimination therein so great that the Interstate Commerce Commission must logically regulate the service for which rates are paid if its regulation of the rates themselves is to be effective.

If this development occurs, there is reason to expect that the force of competition in service may be somewhat diminished. But it would seem that there would always remain considerable opportunity for competitive advantage. Just as differential lines are allowed to charge lower rates, on the ground that they afford inferior service, so the more progressive railway managements which initiate specially advantageous services may be allowed to profit by the increased traffic which such a service brings them. After all, it is one thing to compel uniform and non-discriminatory rates, and another thing to think of compelling equal efficiency in the management of all railways.

Competition with Other Transportation Agencies.—The third kind of competition which has real importance as affecting railway rates is that which takes place among railways and other transportation agencies, such as water lines and motor trucks. A volume might be written about the recent growth of competition between motor trucks and railways for short-haul traffic. Suffice it to say, that the opinion seems to be justified that the motor truck furnishes an important agency for short-haul business, especially in the neighborhood of large shipping centers, and that it will hold its place as an adjunct to the railway for hauls up to some such distance as 50 miles. In doing so, it will help to relieve congestion at terminals, although it brings new problems in the construction of highways and the control of traffic thereon.

The most important kind of competition under the head of other transportation agencies is that afforded by water routes. It is only necessary to think for a moment of the profound effect of the Panama Canal on transcontinental rates to substantiate this statement. As this page is being written (August, 1923) several applications lie before the Interstate Commerce Commission for reduction in transcontinental rates. The Transcontinental Freight Bureau asks for a reduction from the Detroit-Pittsburg district to the Pacific Coast, and the Southern Pacific is requesting a reduction from New York piers to California points, also from the Gulf of Mexico to the west coast. Other applications concern the Chicago-California rates. The point is that this situation arises from the competition of the Panama Canal, which has steadily increased and which has forced the railways to ask for the privilege of making specially low rates to the Pacific Coast to meet the low rates in effect by water carriers.[4]

Summary.—To sum up, we may say that while railway competition is peculiarly limited by the economic characteristics of the railway business, as pointed out on pages 178, 199, there are still important elements of competition which affect transportation and that these elements of competition, if rightly understood, may be preserved to the advantage of shippers and society in general. Happily, the old idea that railways should be forced to compete in rates, just as two grocery stores or two sugar refineries compete, has been abandoned by all informed persons, as is apparent from the permission of pooling and consolidation which now appears on our statute books. Great care and wisdom will be needed to strike a balance between the railways on the one hand and transportation by water and truck on the other, in order that each agency can compete for traffic on the basis of its economic merits. Wisdom and restraint will be required in regulating competition in service, on the one hand to prevent discrimination, and on the other hand to preserve initiative. The competition among producers in different sections—market competition—which depends upon railway transportation is to be encouraged; but only to the extent that, on the one hand, the carriers are not forced to make unreasonable rates, and that, on the other hand, producing and distributing centers which have no economic right to survive are not allowed to compete on an uneconomic and wasteful basis. Since rates and service are subject to regulation, the wastes of competition should be avoided.

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[4] See page 393*f*.

Part IV—Railway Rates in Practice

CHAPTER XVII

FREIGHT CLASSIFICATION AND COMMODITY RATES

Classification

General Nature and Importance of Classification.—In the making of rates on particular commodities, classification is one of the most important steps. Indeed, the Interstate Commerce Commission has said that the first step toward the imposition of rates for the transportation of merchandise is a classification of the articles offered for carriage. Thousands of different commodities must be hauled by railways, and these commodities differ widely both in the cost which their transportation involves and in their ability to pay freight. Altogether, the differences are so numerous as to make the naming of uniform rates impossible, while to name a different rate for each commodity would be thoroughly impracticable. Accordingly, commodities are grouped by the railways into a workable number of classes, and rates are named by classes rather than by individual commodities.

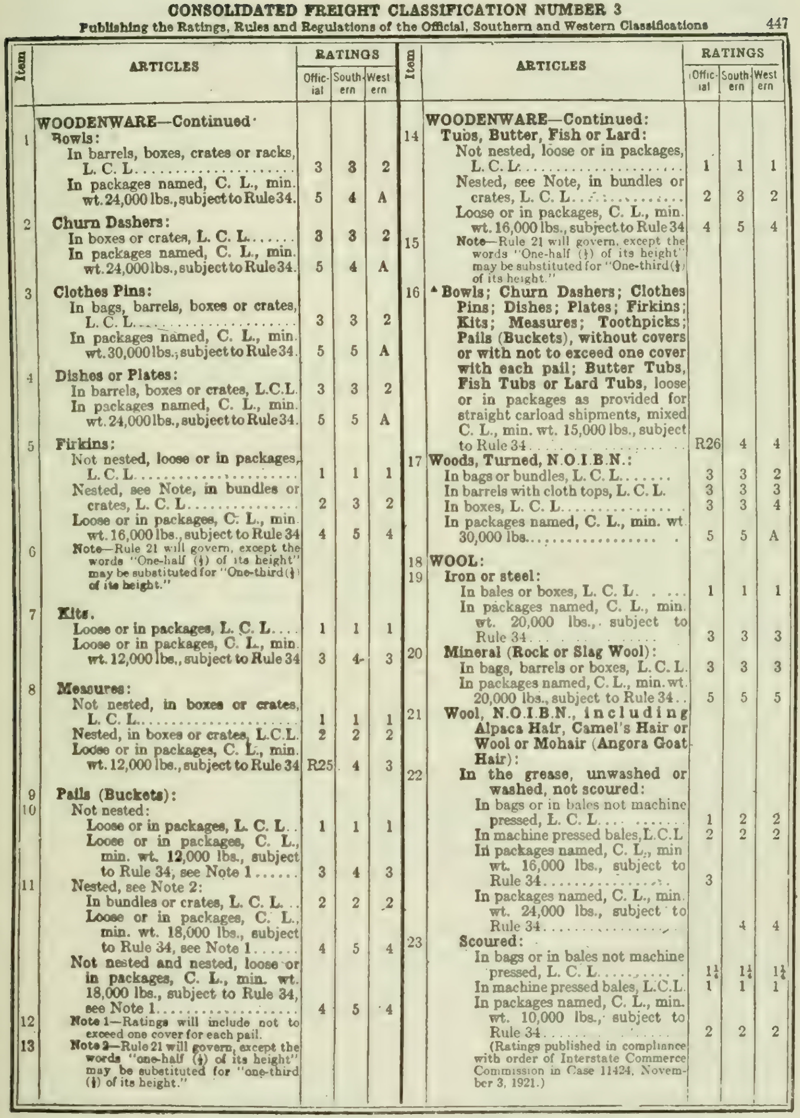
A freight classification is a list and description of commodities moving as freight which assigns those commodities to classes, called "ratings," for the purpose of simplifying the making of rates. In addition, it is customary for freight classifications to prescribe the packing requirements and to lay down rules and regulations governing the transportation of freight. A classification contains a list of commodities, a description of various forms in which each commodity is accepted for shipment, a statement of the class or classes to which each commodity is assigned, the carload minimum weight, and various rules and regulations governing packing requirements, the responsibility of the carriers for damages, the shipment of mixed carloads, etc.

The accompanying page (Fig. 23) from the Consolidated Classification illustrates the way in which classes are treated.

Classification vs. Tariff.—Railway "tariffs" state the rate per hundred pounds which any class of goods must pay for transportation between any two points. The tariff is the document which actually names the rate. The classification gives the "rating" for all commodities which are in the classified list. It is the basis for the application of the tariff. It serves to apportion railway charges among the various groups of commodities, reducing the thousands of individual items to from 10 to 15 "classes."

To look up a rate on a particular commodity which one desires to ship from A to B, one must first learn what classification governs the shipment—for there are several classifications—and then ascertain into what class the given commodity falls. Then one can look up the exact rate in the appropriate tariff, where there will be listed the charge for hauling goods of the given class from A to B or other points.

It is obvious that rate changes may be effected either in the tariff or in the classification rating. It will generally be found that to advance a commodity one class, is equivalent to increasing the rate by from 15% to 25%. This method of changing rates has often been used in the past, and the new Consolidated Classification, which was adopted in 1920, operated to increase rates. A classical instance in which rates were affected by



CONSOLIDATED FREIGHT CLASSIFICATION NUMBER 3

Publishing the Ratings, Rules and Regulations of the Official, Southern and Western Classifications 447

Item	ARTICLES	RATINGS		
		Official	Southern	Western
	WOODENWARE—Continued·			
1	**Bowls:**			
	In barrels, boxes, crates or racks, L. C. L.	3	3	2
	In packages named, C. L., min. wt. 24,000 lbs., subject to Rule 34.	5	4	A
2	**Churn Dashers:**			
	In boxes or crates, L. C. L.......	3	3	2
	In packages named, C. L., min. wt. 24,000 lbs., subject to Rule 34.	5	4	A
3	**Clothes Pins:**			
	In bags, barrels, boxes or crates, L. C. L.	3	3	2
	In packages named, C. L., min. wt. 30,000 lbs., subject to Rule 34.	5	5	A
4	**Dishes or Plates:**			
	In barrels, boxes or crates, L.C.L.	3	3	2
	In packages named, C. L., min. wt. 24,000 lbs., subject to Rule 34.	5	5	A
5	**Firkins;**			
	Not nested, loose or in packages, L. C. L.	1	1	1
	Nested, see Note, in bundles or crates, L. C. L.	2	3	2
	Loose or in packages, C. L., min. wt. 16,000 lbs., subject to Rule 34	4	5	4
6	**Note**—Rule 21 will govern, except the words "One-half (½) of its height" may be substituted for "One-third (⅓) of its height."			
7	**Kits.**			
	Loose or in packages, L. C. L....	1	1	1
	Loose or in packages, C. L., min. wt. 12,000 lbs., subject to Rule 34	3	4	3
8	**Measures:**			
	Not nested, in boxes or crates, L. C. L.	1	1	1
	Nested, in boxes or crates, L.C.L.	2	2	2
	Loose or in packages, C. L., min. wt. 12,000 lbs., subject to Rule 34	R25	4	3
9	**Pails (Buckets):**			
10	Not nested:			
	Loose or in packages, L. C. L. .	1	1	1
	Loose or in packages, C. L., min. wt. 12,000 lbs., subject to Rule 34, see Note 1......	3	4	3
11	Nested, see Note 2:			
	In bundles or crates, L. C. L. .	2	2	2
	Loose or in packages, C. L., min. wt. 18,000 lbs., subject to Rule 34, see Note 1......	4	5	4
	Not nested and nested, loose or in packages, C. L., min. wt. 18,000 lbs., subject to Rule 34, see Note 1....................	4	5	4
12	**Note 1**—Ratings will include not to exceed one cover for each pail.			
13	**Note 2**—Rule 21 will govern, except the words "one-half (½) of its height" may be substituted for "one-third (⅓) of its height."			

Item	ARTICLES	RATINGS		
		Official	Southern	Western
	WOODENWARE—Continued:			
14	**Tubs, Butter, Fish or Lard:**			
	Not nested, loose or in packages, L. C. L.	1	1	1
	Nested, see Note, in bundles or crates, L. C. L.	2	3	2
	Loose or in packages, C. L., min. wt. 16,000 lbs., subject to Rule 34	4	5	4
15	**Note**—Rule 21 will govern, except the words "One-half (½) of its height" may be substituted for "One-third (⅓) of its height."			
16	▲ **Bowls; Churn Dashers; Clothes Pins; Dishes; Plates; Firkins; Kits; Measures; Toothpicks; Pails (Buckets), without covers or with not to exceed one cover with each pail; Butter Tubs, Fish Tubs or Lard Tubs**, loose or in packages as provided for straight carload shipments, mixed C. L., min. wt. 15,000 lbs., subject to Rule 34	R26	4	4
17	**Woods, Turned, N.O.I.B.N.:**			
	In bags or bundles, L. C. L.......	3	3	2
	In barrels with cloth tops, L. C. L.	3	3	3
	In boxes, L. C. L.	3	3	4
	In packages named, C. L., min. wt. 30,000 lbs.	5	5	A
18	**WOOL:**			
19	**Iron or steel:**			
	In bales or boxes, L. C. L.	1	1	1
	In packages named, C. L., min. wt. 20,000 lbs., subject to Rule 34............	3	3	3
20	**Mineral (Rock or Slag Wool):**			
	In bags, barrels or boxes, L. C. L.	3	3	3
	In packages named, C. L., min. wt. 20,000 lbs., subject to Rule 34..	5	5	5
21	**Wool, N.O.I.B.N., including Alpaca Hair, Camel's Hair or Wool or Mohair (Angora Goat Hair):**			
22	**In the grease, unwashed or washed, not scoured:**			
	In bags or in bales not machine pressed, L. C. L.	1	2	2
	In machine pressed bales, L.C.L	2	2	2
	In packages named, C. L., min wt. 16,000 lbs., subject to Rule 34................	3		
	In packages named, C. L., min. wt. 24,000 lbs., subject to Rule 34................		4	4
23	**Scoured:**			
	In bags or in bales not machine pressed, L. C. L.	1¼	1¼	1¼
	In machine pressed bales, L.C.L.	1	1	1
	In packages named, C. L., min. wt. 10,000 lbs., subject to Rule 34............	2	2	2
	(Ratings published in compliance with order of Interstate Commerce Commission in Case 11424, November 3, 1921.)			

Fig. 23.—Sample Page from Consolidated Freight Classification

change in classification came before the Commission in 1920. Prior to 1916 cotton piece goods from the North Atlantic ports, moved to St. Louis and Memphis under the Official Classification, which rated them at 15% less than 2nd class. On January 1, 1916, however, the rates to Memphis were made subject to Southern Classification, under which cotton piece goods were rated 4th class. This change reduced the rate from Boston to Memphis from 72 cents per hundred pounds to 50 cents, while the rate to St. Louis remained 67.9 cents.

Bases of Classification.—In general, it may be said that the same factors which determine particular freight rates also are the bases of classification. The immediate and practically important factors in classification come under one or the other of the following heads: cost, value of commodity, competition. This is apparent from the list of points which must be covered in an application for change of classification, which list brings out so clearly the detailed factors which are considered by the traffic department of a railway that it deserves careful attention.

LIST OF DATA USED BY RAILWAYS IN CLASSIFYING FREIGHT

1. The uses to which the commodity is put.
2. The material of which the commodity is made.
3. The way in which the commodity is packed.
4. Carload or less-than-carload shipment.
5. Dimensions and weight of the article or package.
6. Weight per cubic foot.
7. Value, and especially value per cubic foot.
8. Weight that can be loaded in a standard car.
9. If shipped in carloads, the number of carloads per annum.
10. If shipped in mixed carloads, the articles with which mixed.
11. Where produced.

Each one of these points has distinct importance. The first point advises the railway whether the article is raw material or a finished product and throws light on its value and ability to pay. In a certain classification case,[1] the rating of a certain make of scales hung upon the question as to whether these scales were used for ordinary commercial weighing or for laboratory purposes. Scales suitable for laboratory use were rated double 1st class, while those used for commercial weighing were only rated 2nd class. In this case the use is merely an index of the value per cubic foot of the shipments.

The material of which a thing is made will indicate the risk of breakage or the need of protective service, to say nothing of the light it throws on the bulk and value of the product.

So it goes down the whole list; each item will, after a moment's consideration, appear to have a direct bearing on the rate.

Importance of Weight per Cubic Foot.—Especially important, however, is the value per cubic foot. This factor was mentioned in the foregoing scale case, and receives as much attention in classification matters as any other one factor. For example, one case involved the classification of cast steel vehicle wheels, the rating on which was higher than that applicable to wooden motor truck wheels; but the Commission decided that the difference was reasonable, chiefly because the average value per cubic foot of the cast steel wheels was greater than that of the wooden wheels, while the weight per cubic foot was less.[2] The importance of "specific value" in making rates has been discussed in the chapters on Principles of Rate Making (pages 213-215).

With regard to the statement concerning the point where the commodity is produced, the carriers are probably interested for the reason that this information tells them something as to the amount of competition that will apply, and the probable average length of haul.

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[1] I.C.C. No. 10685, decided September 29, 1920.

[2] I.C.C. No. 10538, decided September 17, 1920.

Illustration of Classification Problem.—A recent classification case may be examined somewhat in detail for the purpose of illustrating the various points that are given practical consideration. The Leigh Banana Case Company complained to the Interstate Commerce Commission concerning the classification of its product, asking a lower rating in Southern territory. It also requested the same classification for bananas shipped in its containers as that given to bananas shipped in other containers.

It appears that at first there had been no special rating on banana carriers, but that this product took the same rating as crates, which was 6th class with a carload minimum of 15,000 pounds. Then the railways raised the rating on banana carriers to 3rd class but made the more liberal carload weight requirement of 10,000 pounds. Upon complaint the Inspection Bureau of the carriers put banana cases down into Class A, which is lower than the numbered classes, restoring, however, the 15,000 pounds minimum carload weight. Next the Southern Classification Committee acted on the matter, ruling that banana carriers should be rated 3rd class. Complaint was made of this ruling, and the Interstate Commerce Commission reduced the rating again to 6th class, this time putting in a 12,000-pound minimum carload. Later the Commission raised the rating to 5th class, with a 10,000-pound minimum; and finally in preparing a revision of the classification, the Southern representatives raised banana carriers to 3rd class, which was the rating that applied in the territory north of the Ohio River. It was at this juncture that the company complained to the Commission asking that its product be reduced to 5th class.

The Commission denied the company's application, and its reasoning well illustrates the factors that govern such cases. In the Commission's report, the arguments pro and con are summed up as follows: On the one hand, the complainant's argument is based on the earnings per carload and per ton-mile arising from the transportation of banana carriers as compared with the earnings on fruit and vegetable hampers, which were rated Class A. The company claimed that the earnings at 3rd class were much greater than the earnings on the other hampers, and insisted that their product should have a rating which would give earnings similar to those secured from fruit and vegetable crates.

On the other hand, the defendant carriers argued that the Class A rating on fruit and vegetable hampers was a specially low rating made to encourage the movement of agricultural products, and that it could not serve as a precedent. Again, they compared banana hampers with other similar products, such as berry baskets, veneer bushel baskets, and cheese boxes, all of which moved under 2nd or 3rd class ratings, with minimum carload weights of from 10,000 to 12,000 pounds. Finally, they reasoned that the weight per cubic foot of the banana hamper, which was 5 pounds, indicated a class higher than that asked for by the company. Banana hampers only average from 3.4 to 3.8 pounds per cubic foot, while articles which moved under Class A rating averaged from 4.8 to 14.3 pounds per cubic foot.

Factors Considered by the Commission.—The Commission upheld the contention of the carriers and summed up the arguments which had convinced it as follows. First, various factors affecting cost indicated the higher classification. In the case of banana hampers the average weight of the *article* was greater and the average weight *per cubic foot* was less than that of fruit and vegetable hampers. The number that could be packed in a standard box car was only 1,950 as compared with 4,500 ordinary hampers, and the weight of the load was only 9,750 pounds as against 13,500 pounds. Again, it was decided that although banana hampers resemble fruit and vegetable hampers, "the circumstances and conditions surrounding the transportation of the two commodities" must be considered, and such a consideration showed that the lack of competition in the shipment of the banana hampers made a lower rating unnecessary. Also the low minimum weight of 10,000 pounds per carload was a consideration which favored the complaining shipper of banana hampers.

The company also asked that less-than-carload shipments of bananas in its carriers should be reduced from 1½ times 1st class to 1st class. This request the Commission also denied on the ground that the company's carrier was covered with a paper or cloth top, while the regular carriers had wooden tops. This difference affected the railway's cost in four ways: more care was required in handling, the risk of damage was greater, theft was made easier, and heavy loading was less possible on account of the impracticability of putting the hampers into the cars in tiers or loading other freight on top of them.

Thus this case brings out clearly a number of important considerations affecting classification, particularly on the cost side, and shows how closely classification is related to the minimum carload weight set by the carriers. The way in which competition affects classification is also indicated. The history of the case is an interesting illustration of how classification ratings can be shifted and by their fluctuations affect competitive conditions.

The Value Factor.—While cost appears to have been the chief factor in the foregoing case the value of the product was also considered; and it is probable that on the whole, the value of the article or the value per cubic foot has generally been the chief factor in classification. For example, the commodities which are rated 1st class or higher, are dry goods, shoes, aeroplanes, etc., while the low-class articles include cement, leather, pig iron, etc. The wide difference in the classes assigned to these groups of commodities is chiefly due to the difference in their specific value, which finds expression in the differences in their ability to pay.

The Cost Factor.—But almost equally important is the cost of transportation as it is affected by the way commodities are packed and the quantities in which they are shipped. This is well illustrated by the item, reclining chairs. Reclining chairs "set up" are rated double 1st class in all sections of the country; reclining chairs, with backs detached, are rated 1st class in all sections; reclining chairs, "K.D." (that is, "knocked down," or taken apart) are rated 1st class in two sections and 2nd class in another.

These ratings are all on a less-than-carload basis. The way in which the quantity shipped affects the classification is illustrated by the ratings on wool. Wool, in bags or bales, shipped in carload lots, ranges from 2nd to 4th class in the different sections of the country, while, with the same packing, wool shipped in less-than-carload lots ranges from 1st to 2nd class.

Necessity for Different Classifications.—The preceding reference to different ratings given in different sections of the country suggests the fact that the same item is differently regarded under different circumstances. It is a fact that not only do commodities differ in value and in cost of transportation, but these differences vary widely in different sections of the country. A commodity may be the chief product of one section and move in large volume over the carriers which serve that section, while in another part of the country it may be of minor importance. Here it may be the chief item of traffic, and there merely a means of enabling the railways to overcome an empty back haul.

Cotton, being a sectional product, well illustrates the point. This commodity, in compressed bales, is rated 4th class in the territory north of the Ohio River and east of the Mississippi; 1st class in the South; and 2nd class in the West. Apparently, the reasons for these differences are that in the Northeast the cotton is a raw material which the railways are willing to give a low rating in order to help the manufacturers, while in the South it is a relatively important item of traffic upon which the carriers must largely depend for revenue. In the West it has neither one of these interests, and accordingly the rating falls between those in the other two sections.

Cotton piece goods also illustrate the difference in classification. In the South, in order to encourage the growing manufactures by enabling them to reach the market, cotton piece goods are only rated 4th class; while in the West, where there are no mills, this product is regarded as "dry goods" and is rated 1st class. In the Northeast, cotton piece goods fall between 2nd and 3rd class.

The Classification Territories.—Accordingly, we find a number of different classifications in existence which have arisen out of the varying needs and industrial conditions in different parts of the country. There are three great classification territories within which lie numerous state classifications. Also, many exceptions are made in what are called "exception sheets." These sheets are issued by individual carriers or groups of carriers, to meet the differences in traffic conditions which affect particular commodities within a classification territory and remove such commodities from the application of the general classification rules otherwise applying throughout the territory.

The three great classification territories are the Official, the Southern, and the Western. (See Fig. 27, page 329.) "Official Classification Territory" includes all of the region lying north of the Ohio River and of a line from Norfolk west across Virginia, and east of the Mississippi River and

Lake Michigan. It thus excludes Wisconsin, Minnesota, northern Michican, and a portion of northwestern Illinois lying west of a line from east St. Louis to Chicago. The "Official Classification Committee," with headquarters in New York, is the body which makes the ratings in this territory, but it is to be noted that this Committee has recommendatory powers only, and its action must be approved by the member carriers.

Southern Classification Territory lies south of the Ohio River and the Virginia Cities and east of the Mississippi. The Southern Classification Committee, with headquarters in Atlanta, makes the ratings in this territory. This Committee also submits its recommendations to member lines for approval or disapproval.

The Western Classification Territory includes all of the country west of the Mississippi River, together with northern Michigan, Wisconsin, northwestern Illinois, and Minnesota. In this territory the Western Classification Committee, with headquarters in Chicago, handles classification matters and is empowered to act for member carriers.

Classification of Inter-Territorial Shipments.—The natural question which arises in one's mind is what classification applies when a shipment moves from one territory into another? Naturally, a shipment which originates and terminates within a single territory, is governed by the ratings of that territory; but when it passes out of one territory into another, there is no general rule by which one can know the governing classification. The matter is determined when the rate is established, and can only be ascertained by consulting the tariff in each case. The governing classification may be that which applies in the territory in which the shipment originates, or it may be that of the destination territory. For example, a shipment from Rochester, N. Y., to Atlanta, Ga., will be governed by the Southern Classification; and one from the same point to Dallas, Tex., by the Western Classification; while shipments from southeastern points to Trunk Line territory will move under the Southern Classification. On shipments from New York to Memphis and New Orleans the Official Classification will apply.

Of course, this problem arises almost entirely with reference to "joint through rates," which are quoted as a unit and therefore can hardly be subject to more than one classification. In the case of "combination rates," which are made up by taking the sum of the local rates, the separate factors are generally governed by the respective classifications in force within the territory through which the shipment moves.

Analysis of the Chief Classification—1. Official Classification.—The Official Classification appears to contain only 6 numbered classes, but in reality there are 8 main classes, for there are other classes, one of which is known as "Rule 25" and another as "Rule 26." The former means a rating of 15% under 2nd class but not less than 3rd class, and the latter a rating of 20% under 3rd class but not less than 4th. In addition, several "elite" classes may be distinguished, these being multiples of 1st class. Thus some goods may be rated 1¼ times 1st class, others double 1st class, and still others 4 times 1st class. When all is said, therefore, it seems that there are in reality a total of 14 classes distinguished by the Official Classification.

Moreover, the spread between the classes is not uniform throughout Official Classification Territory, the ratio of 1st class to 2nd, 2nd to 3rd, etc., being different in different sections. One of the most important scales for determining the spread between classes is the so-called "Disque Scale" which was first applied in the middlewestern states in Central Freight Association Territory. The spread between the several classes under the Disque Scale is shown in the following table:

1	2	R-25	3	R-26	4	5	6
100	85	72	67	54	50	35	28

This may be compared with the spread between classes which is used in the Chicago–New York rate structure:

1	2	R-25	3	R-26	4	5	6
100	87	74	67	54	47	40	33⅓

In the Chicago–New York scale the 2nd, R-25, 5th, and 6th classes are relatively higher with reference to 1st class than in the Disque Scale, and the total spread between 1st and 6th class is less.

2. **Southern Classification.**—The Southern Classification as it now exists provides 6 numbered classes and 4 lettered classes—10 in all. A few of the various scales which have been in force under the Southern Classification will give some idea of what this statement means.

	1	2	3	4	5	6	A	B	C	D
New York–Atlanta..........	100	86	76	64	52	43	35	42	35	32
Chicago–Jackson, Miss.......	100	84	71	60	49	41	35	42	34	30
Louisville–Atlanta............	100	86	76	63	52	43	30	35	27	24

In this territory the old rate structure has been regarded as unsatisfactory on account of new industrial conditions which have arisen. As the Interstate Commerce Commission has said, "Many of the present ratings in the Southern Classification were established under the stress of conditions that do not obtain now in a measure that they once did. In many cases the Southern lines are hauling L.C.L. traffic at what may reasonably be said to be C.L. ratings, while for C.L. traffic many of the any-quantity ratings are too high."[8] In the South it has been common to make few carload ratings—that is, to make few reductions in classification on account of carload shipments—but instead to make the rating applicable to "any quantity." Thus, often no distinction is made between carload and less-than-carload shipments, with the result that, under the Southern Classification, carload shipments receive higher rates than in other territories, while at the same time less-than-carload shipments are often relatively low. Apparently, this situation is due to the relatively small development of large manufacturing and distributing businesses which would most profit by relatively low rates on carload shipments. This condition is to be remembered when the relatively low ratings on many commodities in the South are considered.

3. **Western Classification.**—In the Western Classification there are 10 classes, composed of 5 numbered classes and 5 lettered classes. In addition, there are 6 elite classes, ranging from 1¼ times 1st class up to 4 times 1st class. Various scales governing the percentage of spread between the classes have been prescribed by the Interstate Commerce Commission, as, for example, the following:

	1	2	3	4	5	A	B	C	D	E
Chicago–Springfield, Mo.	100	88	61	45	37	43	38	27	24	22
Chicago–Omaha	100	82	57	40	34	40	34	28	23	20
Chicago–St. Paul	100	83	67	42	33	42	33	29	23	22

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[8] *Consolidated Classification Case,* I.C.C., No. 10204, page 7.

Comparison of Spreads between Classes.—A comparison of the percentage spread between classes found in typical scales representing the major classification territories, will show that on the whole the relation between classes is similar in the scales found in Official Classification Territory and in Southern Classification Territory, the chief difference being in the lower classes. The scales in both the South and West provide for a greater spread between 1st class and the lowest classes, this apparently being to encourage the movement of low-grade traffic in those sections. It is also notable that the Western scales drop more rapidly from 1st class to the lower group of classes, 2nd class generally being in the neighborhood of 25% lower than 1st class, and 3rd, 4th, and 5th classes declining rapidly in comparison with 1st class. But beginning with the lettered classes, the Western Classification scales show that Class A in those scales is higher than 5th class.

State Classifications.—At least nine states have their own classifications, such states all lying in the South or West. Among them are: Alabama, Florida, Georgia, Mississippi, North Carolina, Virginia, Illinois, Iowa, and Nebraska. These classifications were all designed to meet local conditions and often provide many low ratings which are in reality special commodity rates made with the idea of favoring local interests, either by providing low rates on raw materials they require (such as fertilizer), or by giving them cheaper transportation for their products (such as cottonseed). There is little or no justification for these different classifications which are made to apply on the same kind of traffic under the same conditions, except that in one case the shipment is intrastate and in the other interstate. It is confusing, to say the least, and appreciably increases the expenses of the railways. The Consolidated Classification Committee proposed to raise the lower ratings of the state classifications in order to reduce them to a smaller number of classes, but the Interstate Commerce Commission has favored the principle of commodity rates as the best means of enabling the states to make special reductions; that is, the Commission would have such reduced rates taken out of the classified list entirely and have them made as special "commodity rates." The tendency now is to have the states adopt the Consolidated Classification rules and items, and the Illinois classification has already been revised in this way.

Uniformity in Classification—The Consolidated Classification.—In the early days of railroading each railway had its own individual classification. With the growth of through traffic, however, such a multiplicity of differing classifications became impossible. With a given article rated as 1st class on one railway and the 4th class on another, with ratings and scales subject to as many changes as there were carriers, it was obviously difficult for the shipper or purchaser to know what his rate would be or what advantage his competitor might be receiving. Back in 1883, in the *Wabash case*, it was said:

> A shipper desiring to determine freight rates over that road would be compelled to consult a classification for the Middle and Western States in 6 classes; one for the Southern Railway and Steamship Association Territory in 18 classes; one for the Mississippi Valley business in 5 classes; one known as the revised Western in 9 classes; the Trunk Line east in 13 classes, and the Trunk Line west in 5 classes; a classification for Texas points in 8 classes and two for the Pacific Coast, according to direction, in 8 and 9 classes respectively.

This difficulty increased as the volume of long-distance, through traffic grew, while at the same time the growth of railway systems encouraged greater uniformity. About 1890, therefore, the three great classification territories began to take their present form.

Recently—in 1919—the Consolidated Classification has marked a further step in the direction of uniformity. It gives uniformity in rules and regulations, in commodity descriptions, and also, to a great extent, in the important minimum carload provisions. To some extent, even, it marks progress towards greater uniformity in the ratings themselves, but in a majority of cases the old differences between the Official, Southern, and Western Classifications remain as before. The Consolidated Classification merely combines in one volume the three main classifications, and shows the ratings for the three in parallel columns (see Fig. 23, page 269), while the classification for each of the territories is filed by a separate agent with the Interstate Commerce Commission. Incidentally, the Consolidated Classification has added many new items to those previously classified, some of which represent new articles of commerce while others are the result of making specific provision for articles which formerly were covered only by some indefinite general provision, or by analogy.

The Interstate Commerce Commission approved the Consolidated Classification, except that it suggested certain changes in the ratings.

As already observed, the general effect of the Consolidated Classification was to increase rates—especially in Official and Southern Territories—by raising somewhat the ratings in the lower classes, although this effect is incidental, the main purpose being to secure greater uniformity. In the South many articles had been rated much lower [4] than they were in Official and Western Territories, and naturally a move in the direction of uniformity meant many advances in that section. Over 2,500 increases in classification were proposed in the South as against 898 reductions.

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[4] In view of the higher rates in the tariffs and the fewness of carload ratings, this fact did not necessarily favor southern shippers.

The Commission on Uniform Classification.—With general reference to uniformity in classification the Interstate Commerce Commission in the *Consolidated Classification case* said:

> We are now, as formerly, fully convinced that a uniform classification, with such exceptions or commodity rates as may be necessary in special cases, is practicable and desirable. It is an essential part of the general scheme which contemplates greater consistency in rate making and elimination of discriminations and inequalities.

This statement is certainly sound. While it is true that different industrial and social conditions prevent absolute uniformity in classification, it is also true that many of the present differences are unimportant and unreasonable. Not a few of the existing inconsistencies are due to minor considerations, and could be removed without real injury to anyone. This is particularly true of less-than-carload ratings, which do not have as great industrial importance as the carload ratings. In large part the differences in classification among the different territories is the result of "mere differences of opinion" and of the vagaries in the theorizing of traffic officials. Take furniture in less-than-carload shipments (L.C.L.), for example. The Official Classification representative wanted this item in a single class whether wrapped or crated, while the Western Classification man insisted that it be rated one or two classes higher when merely wrapped.

Inconsistencies in Classification.—Some of the inconsistencies and anachronisms are shown in the following instances. Rice flour (bulk, bags, or barrels) in carloads is rated 6th class in the Official Classification, Class C in the Southern

Classification, and 5th class in the Western Classification. Banana carriers, old, any quantity, are rated double 1st class in the Official Classification and the Southern Classification, but 4th class in the Western. Consider also the different treatment given to such similar items as dentists' laboratory benches and wooden desks. The Commission found them to be classified as follows, all the ratings being L.C.L.:

		Wrapped in Burlap	Crated or Boxed
Dentists' laboratory benches	Official	1½	1½
	Western	1½	1½
Wooden desks, set up	Official	1½	1½
	Western	1¼	1
Wooden desks, knocked down	Official	1¼	1¼
	Western	1	2

These differences have been partly removed. They serve no good purpose and increase the troubles both of the shipper and the traffic department of the carriers.

It is doubtless true that complete uniformity in classification is neither desirable nor to be hoped for under present conditions; but it seems clear, in the light of the progress that has already been made, that much more remains to be done. To some extent uniformity in classification will be accomplished only by increasing the number of unclassified or commodity rates, and this will be regarded as a doubtful advantage; but as the South and West become more highly developed industrially, it may be anticipated that their classification ratings will more nearly approach uniformity.

Commodity Rates

Definition.—A "commodity rate" is the opposite of a "class rate." A commodity rate is one which is applicable only to an article described in the particular tariff containing the rate. It is an exception to the classification. Accordingly, a commodity tariff is a schedule which contains only commodity rates. It is a document separate from "class tariffs," and in quoting a commodity rate a freight agent must look it up in a commodity tariff.

Reason for Commodity Rates.—As a general rule, commodity rates are lower than class rates. The reasons for making such rates are as follows:

1. Some commodities move in large volume within a given territory and furnish a long haul. This is true of grain, lumber, and coal. These commodities may be thought of as the wholesale part of the railway business, and they accordingly receive wholesale rates. They get special quantity discounts.

2. Other commodities are of such low grade that they cannot stand any but the very lowest possible rates, and even at such rates can only move for relatively short distances. This case is illustrated by the building materials, such as brick, stone, sand, and lime. These materials furnish heavy loads, while at the same time their specific value is very low. Accordingly, they differ in their economic significance from the first type of commodities. Many railways have local commodity rates made on a mileage basis to cover this type.

3. Sometimes commodity rates are made as a result of competitive conditions, of which several different cases may be mentioned:

> (a) A new manufacturer, or group of manufacturers, may desire to develop a market and may request an especially low rate to enable this. Thus, there is the well-known case of the manufacturer of overalls in Atlanta, Ga., who wanted to get into the St. Louis market. Overalls are given a high rating in the Southern Territory, and in order to prevent loss of revenue, while at the same time giving the manufacturer his opening, the railways put in a special commodity rate on overalls from Atlanta to St. Louis. This left the class rates undisturbed.

(b) Sometimes established manufacturers desire to reach out into new markets. Low rates, for example, were made from Utah to Chicago to enable the beet sugar refiners to compete with the Atlantic seaboard refiners.

(c) Commodity rates are not infrequently made because the railways feel the need of elasticity in rate making. They want to adjust rates from time to time according to fluctuating conditions, as is notably the case in export and import rates. A commodity rate can be changed without affecting the whole class structure.

(d) Water competition has been a factor in forcing low commodity rates in some cases.

Importance of Commodity Rates.—A very large part of the total traffic of the country moves under these commodity rates, it being estimated that such traffic embraces approximately 85% of the total tonnage. This well illustrates the importance of the commodity rate, but it is to be remembered that tonnage and income are two different matters, and a much smaller percentage of the total revenue of the railways is derived from this commodity tonnage.

Methods of Quoting.—Within Central Freight Association Territory, commodity rates on at least 75 articles are based on a percentage of the class rates in force. Thus such heavy chemicals as muriatic acid and ammonia are quoted at 90% of 5th class; whiting is 85% of 6th class; and straw board is 83⅓ of 6th class. In this same territory, however, many low-grade commodities are put on a mileage basis,[5] such commodities including ashes, brick, cinders, common clay, fuel wood, gravel, ice, pulp-wood, sand, sawdust, slag, stone (crushed and curbing), and straw. In the New England territory commodity rates are numerous, and are made largely on a mileage basis. In addition to such articles as those already mentioned, we find coal-dust, coal screenings, loam, logs, and manure among those receiving commodity rates. In Trunk Line territory there appears to be no uniform basis for commodity rates, but between Buffalo and the ports of New York, Philadelphia, and Baltimore, such rates are made with rather close relation to the percentage system which governs the class rates (see page 367). Commodity rates in the South have little uniformity, being governed by competitive conditions.

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[5] See pages 319, 345.

Commodity Rates Not Necessarily Lower Than Class Rates.—As already noted, it is generally true that commodity rates are lower than class rates, but this is not necessarily the case. The Interstate Commerce Commission has said in one case, "Complainant shows principally that the charges on the vegetables named to Chicago would be materially lower if the class rates applied instead of the commodity rates named. We have held repeatedly that adjustments of this kind are anomalous and require much to justify them." [6] In another case involving a commodity rate on packing-house products from Iowa to Minneapolis, which was higher than the 5th class rate, the Commission said that the situation was not in itself conclusive that the rate was unreasonable but held that as the 5th class rate did not seem too low and as the commodity rate was higher than that from other points, it should be reduced.[7] It may be said in general that a heavy burden of proof rests on the carrier which would defend a commodity rate higher than a class rate.

A commodity rate once named becomes the only lawful rate. Between the points covered in the commodity tariff,[8] it takes the article or the class of traffic concerned out of the class rate group.

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[6] 34 I.C.C. 363.

[7] 56 I.C.C. 303 (1920).

[8] By conforming to certain conditions, however, it is possible for a carrier to provide for the alternative use of commodity and class rates.

Commodity rates must be specific and cannot be applied to articles not specifically named merely on the ground that they are analogous. This rule follows from the very nature of the commodity rates, such rates being special and exceptions to classified group rates.

Summary.—In this chapter we have defined and described freight classifications, and have shown the necessity therefor and the part they play in the making of freight rates. The bases upon which freight is classified have been analyzed, and it appears that the chief of these are: (1) the value of the commodity per cubic foot or per carload, and (2) the cost of transportation,—especially as this latter is affected by (a) the size of the carload, and (b) the method of packing. Competition also often plays an important part. The great classification territories have been analyzed, and some indications of the differences which exist among them have been given—especially the variation in the spread between classes which exists among the various classification scales. It has been shown that although much progress has been made, greater uniformity in classification is desirable.

Not all freight rates are found in the classified list. For one reason or another the railways make exceptions to their classifications and name special rates on individual commodities which are known as commodity rates. Commodity rates cover something like 85% of the total tonnage moving by rail, but, because they are generally considerably lower than class rates, do not furnish anything like that percentage of the revenue. The chief reasons for granting commodity rates are: (1) volume of long-haul traffic, e.g., grain; (2) volume of low-grade short-haul traffic, e.g., sand and gravel; (3) special competitive conditions.

CHAPTER XVIII

CARLOAD PROVISIONS AND THEIR SIGNIFICANCE

Importance of Regulations Governing Carloads.—The car is an important unit in railway operation and statistics, and the carload is equally important in traffic and rate matters. A freight-car is a unit of transportation capacity, ranging from 10,000 pounds up to 60,000 pounds and over. It is also a unit of investment and its importance from this point of view has been mentioned on page 18. For these reasons it is important to study the rules made by the carriers concerning the use of cars. More than that, however, the car is the part of the railway plant with which the shipper is most immediately concerned, and the rules governing the use of cars have an important practical bearing on the traffic problems of all manufacturers and merchants.

Carload vs. Less-than-Carload.—There are two cases in which the shipper is charged the carload rate. In the first place, a shipper may charter a car, regardless of the quantity of his shipment, in order to enjoy the exclusive space which it contains. This may be done either to avoid damage or to secure expeditious movement. It is common for shipments of household furniture to be made in this way. The rule governing such cases as laid down in the Consolidated Classification is as follows: "When freight is loaded in a car and tendered as a carload shipment, and the car is forwarded without other freight therein, the shipment will be charged for as a carload."

In the second place, the carload rate may be made simply because the volume of freight to be shipped is so great in quantity as to require one or more cars, the freight being shipped on a *weight* basis. In the general run of such cases, when freight is loaded in a car by the shipper and is tendered by him in a quantity approximately equal to the loading of the average car for the average run of freight, certain minimum carload weights are specified for each article as a basis for charge, and the shipment may move as a carload.

Requirements for Carload Rates.—It is said that the freight *may* move as a carload because, even though the quantity is sufficient to fill a car, there are certain prerequisites that must be fulfilled if the freight is to receive carload treatment. In the first place, Rule 14 of the Consolidated Classification specifies: "Carload ratings or rates apply only when a carload of freight is shipped

from one station,
in or on one car,[1]
in one day,
by one shipper, for delivery
to one consignee,
at one destination.

Only one bill of lading for one loading point and one freight bill shall be issued for such carload shipment."

In the second place, certain limitations are made on account of size, perishability, and other characteristics of the articles shipped. One may regard the reductions in freight charges which are generally made for shipments in carload quantities as quantity discounts which are given only on the condition that shipments are handled in a wholesale way and constitute bona fide a single large unit of traffic.

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[1] Certain exceptions are made in Rule 24 of the Classification.

It is sometimes the practice of groups of merchants, such as grocery jobbers, to ship or receive what are known as "pool cars," that is, carload shipments which are to be shared among a number of shippers; but such cars must be billed and handled as a single shipment. In some cases, too, the carriers allow a carload to be stopped at more than one point for the purpose of delivering a part of the load at an intermediate point. For this privilege, however, an extra charge is made.

Minimum Weight and Charge; Loading.—It will be noted that in the second case—that is, in the case when the carload shipment results from tendering freight in sufficient quantity to require a car—the determining factor is the minimum carload weight required. If that weight is 30,000 pounds, the freight tendered must weigh at least 30,000 pounds if full advantage is to be gained from the carload rate, as that rate is based on the minimum weight.

There is a minimum charge for carload shipments, which is at present $15. No matter what the quantity or character of freight, no car will be handled for less than that sum. This does not apply to switching charges or to certain heavy commodities.

In all cases the shipper has to load and unload carload freight, Rule 27 of the Consolidated Classification providing that "Owners are required to load into or on cars . . . and to unload from cars . . . freight carried at carload ratings."

The tender of freight as a carload lot will determine its carload rating. A shipper once loaded at his yard a less-than-carload shipment in a car which he had ordered from the railway. He found that the less-than-carload rate would be lower than the carload rate based on the minimum carload weight applicable to his commodity, and as he had done the loading himself, he claimed that the railway should give him the lower less-than-carload rate. The case went to the Interstate Commerce Commission and that body decided that when a shipper tenders to the carrier a shipment as a carload, the carload rate and minimum carload weight must apply even though the less-than-carload rate would be lower. If a car is ordered and is set on a shipper's siding and is loaded by the shipper, that shipper has received carload service. This will be evidenced by the tender of a bill of lading showing the number and initial of the car. Thus in differentiating between carload and less-than-carload traffic much depends upon the manner of tender.

Rules Covering Less-than-Carload.—"Less-than-carload" applies only when shipments are tendered on the basis of weight and the determination of less-than-carload shipments is covered by the following rule: "When both carload and less-than-carload ratings are provided for the same article, the term 'less-than-carload' covers shipments in quantities less than the minimum weight provided for carloads." The salient facts of interest to the shipper are:

1. The shipper does not have to load less-than-carload freight into the car except in those rare cases in which the article is so heavy or bulky that the regular station employees cannot handle it. Ordinarily, less-than-carload freight is delivered to the railway freight house and is loaded by the railway.
2. There is no minimum weight fixed for less-than-carload freight.
3. The lowest minimum charge on less-than-carload freight is 50 cents. (The minimum may be higher, being based on the charge for 100 lbs. at the class or commodity rate applicable.)

Effect on Classification.—The difference between carload and less-than-carload freight has considerable significance in classification, and frequently the same article or commodity receives a lower rating when shipped in carload quantities than applies on less-than-carload shipments. A few examples taken at random from the classification will serve to illustrate this fact and also to show the amount of the difference.

DIFFERENCE IN RATING ON ACCOUNT OF CARLOAD AND LESS-THAN-CARLOAD QUANTITY

	Classification		
	Official	Western	Southern
Beef extract, in glass or earthenware packed in barrels or boxes, L.C. L..	1	1	1
" " C.L., minimum weight, 30,000 lbs.	3		3
Mattresses, in bales, wrapped, L.C.L.........	1½	1	1
" C.L., minimum weight, 10,000 lbs.	2	2	2
Zinc plates or sheets in rolls, L.C.L..........	2	2	1
" " " " C. L., minimum weight, 36,000 lbs............	5	5	5
Rosin in bulk, in barrels, L.C.L.............	4	5	4
" " " " " C.L., minimum weight, 36,000 lbs...	6	6	C
Wooden bowls, in racks, L.C.L..............	3	3	2
" " C.L., minimum weight 24,000 lbs. (Rule 34)............	5	4	A
Wool, scoured, in bags, L.C.L...............	1½	2	D1
" " C.L., minimum weight 10,000 lbs. (Rule 34)............	2	2	2

In all these cases, when the goods are shipped in carload lots, they are put in a lower class than when shipped in less-than-carload quantities, the difference in rating ranging from one to three classes. It is important to note that in those cases in which the difference is greatest, the minimum carload weight is high, and in order to get the low rating, it is therefore necessary for the shipper to tender a heavy loading, ranging from 30,000 to 36,000 pounds.

Reasons for the Differences between Carload and Less-than-Carload Ratings.—Carload shipments are generally given a lower classification than less-than-carload shipments, and this is true simply because the former cost the carriers less to move. What are the reasons for this fact?

To begin with, carload shipments, as we have seen, are loaded by the shipper at the point of origin and unloaded by the consignee when they arrive at their destination. All the railway has to do is to place the car. This greatly reduces the railway's terminal expenses.

In the second place, carload shipments do not go through the carriers' freight-houses, and consequently do not make such great demands upon its storage and handling devices. This tends to prevent or relieve congestion.

In the third place, the average loading of carload freight is much heavier than that of less-than-carload freight, with the result that the proportion of tare, or dead-weight, is much less. One of the most important factors in economical operation is the size of the carload (*net* tons per car), and carload freight means relatively large carloads. It is probable that the average carload of L.C.L. freight is between 7 and 8 tons in weight, while carload freight averages between 35 and 40 tons. The average net tons of all freight per loaded car ranges between 27 and 30 tons, and it is generally recognized that the maintenance of a 30-ton average would go far toward solving the car shortage problem, as well as materially help to reduce operating expense per ton-mile.

Fourthly, less-than-carload shipments often involve considerable additional expense in the shape of extra handling while en route. The carload freight is loaded into "straight" cars which move through without rehandling from a single point of origin to a point of destination. It may be quite different with less-than-carload freight. To begin with, the car containing a large number of such shipments often moves a short distance to some junction point where the contents have to be rehandled and made up into cars for different branches or roads. When an L. C. L. merchandise car containing shipments for several towns arrives at some town for which a shipment is billed, it must be opened and the particular shipment be taken out. This may involve considerable rehandling of the contents of the car. It means delay in train movement, and sometimes the car may be set out to be picked up the next day and moved on its way to towns further along the line. The way of the "way freight" is often hard.

Then, also, less-than-carload freight requires more trouble and expense per ton in connection with billing and collection. This is especially true when such expense and trouble is compared with the quantity shipped.

Finally, the loss and damage claims are naturally much larger in the case of less-than-carload freight, partly because of the greater opportunity for loss and theft which comes from the handling and rehandling of the freight by others than the consignor and consignee, and partly from the greater frequency with which the freight must be handled.

Thus the reasons for making lower charges on carload freight are fairly obvious, and no one will deny that some considerable difference is justifiable. The only trouble is that this difference is too often fixed arbitrarily which makes discrimination possible.

Effect of Carload Rates on Industry.—The spread between carload and less-than-carload ratings has important industrial consequences, and variations in that spread may be made the means of making discriminations among persons and places.

As a general thing it may be said that low carload rates favor large shippers and large purchasers. The manufacturer who is buying his materials and supplies in carload lots is in a position to undersell a little competitor who must buy in smaller quantities if the difference in the rating just referred to is a large one. Similarily, the large wholesaler who can stock his warehouse with goods purchased in carload lots has an important advantage over the merchant whose business is done on a smaller scale. In general, therefore, the growing tendency to increase the number of carload ratings is an indication of the increased tendency to large-scale business, and the larger number of such ratings in the Official Classification than in the Southern Classification indicates the greater development of large-scale industry in the North.

Local Wholesalers Favored by Carload Rates.—Low carload rates also favor the local wholesaler as compared with his distant competitor, even though that competitor may be larger. For example, the wholesale grocers of Jacksonville, Fla., can purchase flour from northern millers in carload quantities and are in no danger of competition from Chicago and New York jobbers, who would have to ship flour into the Jacksonville territory in less-than-carload lots. Relatively low carload ratings have made Chicago the jobbing center of the Middle West in place of New York. The eastern jobbers have sought to have relatively low less-than-carload rates in order that they might ship their goods into the western territory on favorable terms, while the western jobbers have stood for low carload ratings.

An interesting case, which will illustrate how these matters affect competition, is that in which the Procter and Gamble Company complained to the Interstate Commerce Commission against putting in carload ratings to the South on their products. This company, which is a manufacturing concern, was beginning to sell direct to the retail trade, and it accordingly wanted freight rates which would be as low on less-than-carload shipments as on the carload shipments made to the southern jobbers who were in competition with it. It urged that the old "any-quantity" rates be restored, its arguments being that the retail dealers did not have the storage space or the financial ability to handle soap in carloads, and that they would therefore have to pay the higher less-than-carload rates from its place in Cincinnati. To this argument the southern jobbers replied that by shipping the soap to them in carload quantities that product could be distributed among the local retailers on a basis which would only involve less-than-carload ratings for short local hauls. Naturally, the decision in this case was that the establishment of carload ratings was justified.

The Two-for-One Rule.—The question naturally arises, What is to be done when a shipment is received which is greater than the capacity of a single car but is not sufficient to make two full carloads? This situation has given rise to a number of rulings by the carriers and by the Interstate Commerce Commission.

The Commission's rulings cover the general situation. If a carrier is unable to furnish as large a car as that ordered, it may furnish two smaller cars to be used on the basis of the minimum carload weight for the car that was ordered. If a car of smaller size than that ordered by the shipper is furnished, it may be used on the basis of the actual weight when the car is loaded to its full visible capacity, and if the car will not contain the shipment, the goods may be partly loaded in another car and the whole be treated as a single shipment, subject to the minimum carload provision governing the car that was ordered.

If a carrier for its own convenience supplies a larger car than the shipper orders, the car may be used on the basis of the minimum carload fixed in the tariffs for the smaller car ordered.

Two cases are provided for in the carrier's rules.[2] The freight received may be in excess of any carload. In this case the Classification rules provide that the excess shall take the carload rate and be charged at that rate for the actual or authorized weight. This liberal provision, however, only applies to articles which have a minimum weight of at least 30,000 pounds; the first car must be loaded to capacity; and the right is reserved to load other freight in the excess car.

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[2] See Consolidated Classification, Rules 24 and 34, Section 3.

The other case arises in case of bulky commodities when the carrier is unable to furnish a car as large as that ordered by the shipper, and instead supplies two shorter cars. According to the Commission's ruling, in this case—providing the total weight of the shipment is not less than the minimum weight for the car that was ordered—one of the cars will be loaded to capacity and charged at the minimum weight for that car, while the remainder of the shipment will be allowed to move at the carload rate applied on its actual or estimated weight.

The act of a carrier in furnishing two smaller cars binds all the other carriers who are party to any joint rate, and the connecting carriers must observe the rate, the minimum carload, the privileges, and the charges which would have applied if the shipment had moved in a car of the size ordered. But the shipment may move beyond a point to which the joint rate applies, in which case the connecting carrier not a party to that rate may charge according to its own tariffs and minimum carload provisions. In this case, the initial carrier which supplies the car must bear any additional charges which may be caused by its inability to furnish the equipment ordered, and the other carriers which were parties to the joint rate may be asked to share the responsibility.

The Minimum Carload.—In all cases when a carload rating is given a minimum carload weight is named which is the basis of the carload charge; that is, the minimum charge for hauling the car will be based on the assumption that its contents weigh as least as much as the minimum named. The importance of the minimum carload provisions of the rules is shown by the fact that they are part of the freight rate, and must be filed with the Interstate Commerce Commission and publicly posted in the same way as the tariffs are. In connection with through rates the carriers must publish a single carload minimum weight covering the through movement.

The minimum carload weight is chiefly determined by three factors: (1) the average loading capacity of the car; (2) the weight per cubic foot of the commodity; and (3) the prevailing custom as to size of shipments. The size of equipment available in some sections of the country differs from that in others, and it will be found that the average capacity of freight-cars is considerably greater in the northeastern section than in the South. If other things are equal, the minimum carload will have to be lower in sections which have smaller cars than in those where the cars have a greater average loading capacity.

Regardless of section, however, the minimum carload weight varies with the size of the car, and the carriers have worked out a graduated scale of minimum carload weights applicable to certain commodities, which is set forth in Rule 34 of the Consolidated Classification. This scale applies to the use of extra large cars for light and bulky articles, and is necessary to insure the economical loading of such equipment. The general scale is as follows: The minimum for standard cars, 36 ft. 6 in. long, or smaller cars, is that specified in the Classification, but for larger cars there is a graduated scale of greater minimum weights. Thus, when the car furnished is 39 ft. 6 in. long, and the minimum carload weight specified in the Classification for a commodity is 10,000 pounds, the charge will be based on not less than 11,200 pounds; and if the article is one on which the specified minimum is 15,000 pounds, the charge will be based on a weight of not less than 16,800 pounds, etc. All of the articles to which this graduated scale applies are relatively light and bulky, such as agricultural implements, stoves, drain tile, wooden pipe, wool, etc.

Carload Minimum Varying with Commodity.—The average loading capacity of a car, in tons, in turn depends upon the kind of commodity, for commodities differ widely in their specific gravity, or weight per cubic foot. This is the reason why such articles as banana hampers have a minimum carload weight of only 10,000 pounds, while pig lead is given a minimum of 36,000 pounds. Naturally, the railways seek a minimum carload which will insure a paying load, their charges being made on the basis of weight. This matter is well illustrated by a case concerning shingles.[3]

The Pacific Coast Shippers' Association complained that their charges on certain carload shipments of shingles were unreasonable because based on a carload minimum weight of 36,000 pounds east of Duluth, Minn. The Association contended that it was impossible to load the cars furnished by the carriers with 36,000 pounds of shingles, and sought reparations for charges in excess of those based on a reasonable requirement. It appears that when loaded to full capacity the cars furnished accommodated a load of shingles weighing in the neighborhood of only 34,000 pounds. On the record the Commission decided that the 36,000-pounds minimum was unreasonable.

The other factor affecting minimum carload weights is the prevailing condition with regard to the size and volume of shipments tendered by manufacturers and merchants. On the average, in the East, where there are great factories and large jobbing concerns, the shipments will be larger and certainly the volume of traffic will be greater than in the South. This will necessarily mean that carload shipments are more frequently called for, and it seems probable that this fact alone would explain the tendency on the part of the carriers to enforce higher carload minima.

On the whole, the chief differences in minimum carload weights appear to arise from differences among commodities. The reality of the other factors in explaining differences, however, is illustrated by the fact that in some cases the minimum carload weights for the same commodities vary in the different classification territories. For example, wool in grease has a minimum weight of 16,000 pounds in Official Classification Territory and 24,000 pounds in Western Territory. In the Southern Territory there are several cases in which no carload rates are named, and consequently there are no minimum carload weights.[4] "Any quantity" rates exist in all territories, but are especially numerous in the South.

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[3] I.C.C., No. 10540, decided September 28, 1920.

Commission Rulings on Minimum Weight.—What has been said with reference to the factors which determine the minimum carload is perhaps sufficient to indicate the justification for requiring such a minimum. It may be added, however, that the Interstate Commerce Commission has formally recognized the reasonableness of the requirement by the carriers of a minimum carload weight, subject only to two provisions, namely, that when there is such a requirement the carload rate must be relatively less than the less-than-carload rate (which is generally the case), and second, that the requirement be calculated to induce efficiency in the loading and movement of freight.

Mixed Carloads and the Mixing Privilege.—What has been written thus far concerning carloads, less-than-carloads, and minimum carload weights, has nearly all been based upon the assumption that only one class of freight is put into the car. It has been assumed that the cars of C. L. freight are "straight" cars, and the minimum carload weight has applied to a single commodity. As a matter of fact, it not infrequently happens that a shipper desires to fill a car with different articles, and that these articles fall into several different classifications, each of which may have a different carload rate and be subject to different minimum carload weight provisions. A wholesale grocer, for example, may desire to receive in a single car various kinds of canned fruits and vegetables, bottled ketchup, vinegar, etc., the mixed shipment to come from a single consignor and to be billed to a single consignee. On the other hand, the manufacturer, say a meat-packer, may also desire to ship in a single carload such various products as fresh meat, cured meats, canned pork and beans, and other packing-house products. In order to make reasonable accommodation for such mixed carloads the railways have adopted Rule 10 in the Consolidated Classification.

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[4] For example, felt clippings, cream of tartar, etc.

The rule governing the mixing privilege now stands as follows: In Official Classification Territory, when a number of different articles, for which carload ratings or rates are provided, are shipped at one time by one consignor to one consignee and destination, in a carload, the articles will be charged at the carload rate applicable to the *highest classed or rated* one of them. The carload minimum weight will be the highest provided for any of the articles in the carload. In Southern and Western Classification Territories, the provision is similar, but differs in some respects, chiefly in connection with commodity rates. In those territories the mixing privilege does not apply in connection with commodity rates (except, under the Southern Classification, on articles classified as "Fertilizer" rates or "Special Iron") ; and the charge is based on the highest *class* carload rate applicable.

This difference also appears in connection with a provision that when the total charge on a shipment would be lower if the articles were considered as divided into two or more separate carloads, the charge will be made on that basis. Under Official Classification the charges on each separate carload will be based as stated above,—on the rate on the highest classed *or rated* articles, and the highest minimum carload provided for any of the articles. But under Southern and Western Classifications, the charges on each separate carload are based on the rate applicable to the highest *classed* article therein, with the minimum carload determined as in Official Territory. If, however, a commodity rate is applicable to one of the separate carloads, the carload minimum weight applicable to such commodity rate applies to that carload.

"Specific Mixtures."—In addition to this general provision, groups of carriers in the South and West have in force in their tariffs rate provisions concerning "specific mixtures," that is, they have made special carload rate provisions applying to certain definite groups of commodities which shippers are specifically authorized to combine in a carload and ship as a unit. These groups of commodities have been generally based on some relation existing among the several articles, as in the case of packing-house products or agricultural implements, which groups include widely different commodities all produced by the same company. If such specific mixtures are provided for, this fact does not prevent the inclusion of the article specified in other mixtures subject to the foregoing rule. Moreover, if the carload rate and minimum weight under the foregoing rule should result in a lower charge for moving the car than the rate provided for a specific mixture, the lower rate would apply.

The rule governing mixed carloads now in force is in some respects similar to the old Official Classification rule. Formerly, the Southern and Western carriers had no general mixing rule, although they provided for certain specific mixtures. The rules were to the effect that no two or more articles, each of which had a carload rating, should be shipped in mixed carloads at a carload rate unless specific provision was made therefor. The new rule has thus extended the mixing privilege. As to Official Classification Territory, the only change has been to raise somewhat the minimum carload weight.[6] The effect in the South and West has been to increase the possibility of utilizing carload provisions to a much greater extent than formerly.

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[6] The old rule had it that the minimum weight on a mixed car should be that applying to the article taking the highest rate, which would not necessarily be the one taking the highest minimum weight.

Another effect of the more uniform extension of the mixing privilege will occur with reference to the special carload rates which have been made by some states on mixed shipments for the purpose of encouraging local business. The Texas Commission, for example, has had in force a low rate on mixed carloads of such commodities as are sold by general stores and small local jobbers, such rates applying from the port of Galveston to Texas common points.[7] As the steamship lines from New York to Galveston also make low rates for such mixtures, it has been possible for New York jobbers to compete on favorable terms with jobbers in St. Louis and similar centers, from which the goods have been shipped under less-than-carload ratings.

Mixing Privilege Opposed by Smaller Jobbers.—Just as certain jobbing interests are adversely affected by making carload rates relatively lower than the rates on less-than-carload shipments, so certain interests have been opposed to an extension of the mixing privilege. Especially have strong protests been made by many Southern and Western jobbers. These jobbers argued that the new rule would give a great advantage to the big distributors in Chicago and St. Louis. They said that the big central jobbers would be allowed by the rule to ship mixed carloads direct to the retailers at a rate which would enable them to undersell the small local jobbers. The retailer could not buy straight carloads of any single article, but he could take a mixed carload made up of the commodities which he carried in stock. The local jobber's transportation charge would contain two elements: (1) the carload rate from the manufacturer, and (2) the less-than-carload rate to the retailer. If the sum of these two elements were greater than the mixed carload rate from the big central jobbers to the retailer, the local jobber might lose the business. Naturally, they urged that the mixing rule would particularly affect high-grade "specialties," which are the most profitable part of a jobber's business and in the marketing of which the big central jobber already has the best chance to compete in the local market because of the fact that the freight rate is a smaller percentage of the value of the article.

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[7] See map, page 329.

Freight Forwarders Benefited.—It was also claimed by certain business interests that the extension of the mixing privilege would increase the business of freight forwarders who operate by consolidating small loads for shipment to retailers at a given point. This claim was urged with a special reference to the Pacific Coast points and to inter-mountain territory, as the rates to these points show a specially great spread between the carload and less-than-carload ratings. Clearly, the greater the difference between carload and less-than-carload ratings the more significance there is in allowing shippers to have a carload rating on mixed shipments which would otherwise have to move on separate less-than-carload rates.

Commission's Opinion on Mixed Carloads.—The opinion of the Interstate Commerce Commission has been favorable to the rule adopted by the carriers. The Commission has stated that the foregoing arguments and claims are exaggerated, and that the alleged evil consequences would not materialize to any extent sufficient to outweigh the advantages of the mixing privilege. The great advantage would be that the movement of freight in carload lots would be increased, which would bring all the economies of carload movement (see page 295), and especially would relieve congestion at freight-houses. The Commission pointed out also that the use of specific mixtures breeds discrimination and tends to give advantages to those shippers who are in a position to make use of the particular mixtures that are specified. Finally, the Commission called attention to the close relation that exists between the mixing privilege and uniformity in classification. We have seen that greater uniformity was, and still is, desirable; but the existence of different specific mixtures in different territories means that general rules concerning ratings are impossible, the carload ratings and minimum carload weights being an essential part of classification.

The conclusion must be that the Interstate Commerce Commission's position in this matter is sound, and that it is in the best interests of the railways and of the country as a whole that the shipment of mixed carloads should be extended under general provisions which will minimize discrimination. As long as the carload can be handled by the railway as a unit, there appears to be no sound reason why it should not be given similar treatment in rate making, whether it contains one kind of commodity or a dozen.

Summary.—In this chapter we have dealt with a group of points each of which centers in the carload and consequently has an important bearing upon the economy of railway operation and the interests of the shipper. The rules governing carload and less-than-carload shipments have been stated, together with the reasons therefor and the effect upon business interests. It is especially important to bear in mind the several economies in transportation which attend the shipment of goods in carload lots.

We have seen that in order to insure the economic utilization of car capacity and to secure adequate revenue, the carriers have adopted a rather elaborate set of provisions concerning minimum carload weights, requiring different minima according to loading capacity of cars, kind of commodity, and prevailing size and volume of shipments.

The progress made by the carriers, with the approval of the Interstate Commerce Commission, in extending the mixing privilege has been noted, and it has been pointed out that in spite of the objection of local jobbing interests, this extension is desirable as increasing operating economy and decreasing discrimination.

In conclusion, the close relation between the various carload provisions and the classification of freight should be noted. The spread between carload and less-than-carload rates is in reality directly connected with classification, as the same commodity when shipped in carloads may be given a classification rating of from one to three classes lower than when shipped in less-than-carload quantities. The mixed carload rules are intimately associated with classification matters in that the rating of a mixed carload is involved, and under the mixing rule the several articles contained in the car are given a carload rating which is different from that which they would receive when shipped in straight cars. The same may be said with reference to their minimum carload weights. The rules concerning minimum carload also have an important bearing upon the classification of freight, inasmuch as (1) both the classification rating and the minimum carload weight depend to an important extent upon the weight per cubic foot of the article, and (2) a reduction of the minimum carload required may partly or wholly offset an increase in classification. It is an advantage to a shipper to be able to receive the benefit of a carload rating on a smaller shipment.

CHAPTER XIX

FREIGHT TARIFFS AND ROUTING

FREIGHT TARIFFS

Definition.—A freight tariff is a schedule of rates or charges for transportation or other services performed by a railway. It generally also includes a statement of rules and regulations affecting the relation between rate and service. It is in "tariffs" that the shipper finds quoted the amount that the railway charges for transportation. They are price lists of railway services.

So numerous and technical are railway freight tariffs that it is essential to have thoroughly in mind the meaning of the terms used to designate the various kinds.

Classification of Tariffs.—To begin with, tariffs may be classified according to the kind of traffic or service to which they apply. Thus there are "class tariffs," giving rates on classified articles: 1st class, 2nd class, etc.; "commodity tariffs," giving rates on specific commodities and not on classes of commodities; and "special service tariffs," as switching tariffs, and tariffs governing refrigeration, milling in transit, reconsignment, etc.

Again, tariffs are classified according to the number of lines which are involved in the transportation service. "Local tariffs" quote rates which apply between points on a single railway line. "Joint tariffs" are those which quote rates between points on one line and those on another line. Two or more railways participate in making joint tariffs.

Then there are "individual tariffs" and "agency tariffs." The former are established and published by a single railway, while the latter are published by an agent for a group of railways. Most agency tariffs are joint tariffs, but in territories where local rates are made on a uniform basis (as on mileage), such rates, too, are often published as agency tariffs. Thus the distinguishing feature of the agency tariff is that it involves the concurrence of a group of carriers.

Finally, we must note that some tariffs quote "through rates," and that such rates may be made up in various ways. A through rate is one which embraces the total freight transportation charge between origin and destination points. Through rates may or may not be in effect between two given points. If there is a through rate, it may be local or joint, depending upon whether or not more than one road is involved.

Whether local or joint, through rates may or may not be "combination rates." A combination through rate is made by combining two rates published in separate tariffs, as a through rate from Chicago to Mobile composed of the sum of a local rate from Chicago to Cairo and another local rate from Cairo to Mobile.

Finally, combination rates may or may not be "proportional rates," depending on whether they are made on a combination that contains one part which is established only as a basis for constructing other rates. Thus, if a rate is made from Boston to New York specifically for use as a factor in making rates to points beyond New York, it is a proportional rate. The only purpose is to use it in making a through combination rate, and it is not applicable on traffic which terminates at New York. It is merely a basing rate.

Government Control over Issuance of Tariffs; Interstate and Intrastate Tariffs.—One of the most impressive facts about railway freight tariffs in the United States is the extent to which the shipper is protected by government regulation of their form, content, and publication. Tariff circular 18-A issued by the Interstate Commerce Commission prescribes that tariffs must be printed and be of a certain form and size. Important parts must be set in bold type. The title page must be in a prescribed form and contain a full description of the general nature, territorial application of, and authority for, the tariff. There must be a table of contents, and an index of commodities when commodity rates are given. When a tariff contains changes in rates, these must be specifically indicated. Directions must be specific and when such general terms as "common points" or "grain products" are used, the various points or products must be listed. If mileage rates are used, an official list of stations and distances must be published.

Various rules are made to avoid uncertainty and conflict in published rates. If a commodity rate is in effect, it is the rule that such a rate supersedes the class rate and is the only lawful one. The shipper is given opportunity to complain of, or to adjust himself to changes by requiring that, except under special permission from the Commission, rates cannot be changed unless notice has been filed and published for 30 days.

Of course, tariffs may apply to interstate or intrastate traffic; but the former are much more important. If the traffic covered by the rate enters more than one state, it becomes interstate, and if a rate which is established between two points in the same state is used as part of an interstate combination rate, it becomes subject to interstate control.

All tariffs which apply to interstate traffic must be filed with the Commission and must be published, bearing a Commission number. Moreover, all such rates, under the law must be posted for public inspection and shippers can find on file at any station all rates applicable from or at that station. Also, every railway posts at some designated station or stations in one or more states through which it passes all interstate tariffs from, to, or via all stations on its line. Several states require the posting of intrastate rates applying in such states at designated points within their bounds. In addition, each carrier must file with the Commission an index of all tariffs which it publishes or in which it participates (joint rates).

Interstate rates and intrastate rates may or may not be published in the same tariff. In any case they should not be confused. In some states, intrastate tariffs must be filed with the state commission before becoming effective, but in others the railways have merely to post the rate.

Looking up or "Checking" a Rate.—When a shipper desires to ascertain the rate for any commodity between two given points, the complete procedure may be as follows:

1. Ascertain what railway or railways connect the two points. The usual source of this information is *The Official Guide of the Railways and Steam Navigation Lines of the United States, Porto Rico, Canada, Mexico, and Cuba.* Several routes may be open. The choice has to be determined, as will be discussed further on in this chapter. Here attention is merely called to the desirability of choosing a route which involves the use of only a single railway, if that is possible.

2. Having determined the route, ascertain *what tariff or tariffs will apply* on shipments over that route. To do this consult the "Tariff Index Circular" or "List of Freight Tariffs" of the initial line—if more than one road is involved and the initial line is determined upon. When a joint tariff must be used, and if there are several possible initial lines, while the destination point is only served by a single line, it is well to consult the tariff index of the delivering carrier, as it will contain a list of all tariffs to the destination point.

Tariffs are numbered and may have one or more numbers according to where they are filed. Each has the number of the individual line or agency which files it, and in addition may have an Interstate Commerce Commission number, a state commission number, and a Canadian Railway Commission number (e.g., New York, Ontario and Western joint freight tariff No. 103 also bears the numbers I.C.C. No. 8742 and P.S.C.–Pa.[1] No. 638).

3. Now comes the important question, Is there *any commodity rate* effective on the article in question? If there is one, it will probably be lower than the class rate. The chances of finding one are good if the article is one of the heavy low-grade type and moves in carload quantities. The tariff index of the carrier will contain a section listing tariffs which quote nothing but commodity rates. If the article is not covered by a special commodity tariff, it may still have a commodity rate published in a "class and commodity tariff," and when a tariff contains both class and commodity rates, a list of commodities is referred to in the table of contents.

Commodity rates, when applicable, always take precedence over class rates, unless special provision is made for their alternative use.

In some cases, railways issue "exception sheets," which modify the ratings contained in the classification. These exceptions to the classification take precedence over the classification proper, and if the tariff refers to one, it must be consulted.

4. Next, obtain a copy of the tariff—commodity tariff, class and commodity tariff, or class tariff, as the case may be—from the general freight agent or Tariff Bureau of the railway, and ascertain if the tariff is applicable on your shipment in so far as the question of *interstate or intrastate movement* is concerned. This can be inferred from the presence or absence of state and federal tariff numbers, or the title page may contain some such statement as "applicable on both interstate and intrastate traffic." Consult the page dealing with

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[1] Public Service Commission of Pennsylvania.

"Application and explanation of tariff," which will be found listed in the table of contents.

5. If the article has no commodity rate, a class tariff must govern, and the next step is to determine what *class rating* applies. To do this one consults the Consolidated Classification, unless the shipment is intrastate and there is a state classification which governs. In any case the tariff specifies the governing classification. In the classification is found not only the class number, but the minimum carload and other rules and regulations of importance. By changing his packing, the shipper may be able to secure a lower rating.

6. If the points of origin and destination are on different roads, a joint rate is involved, and if the shipper desires a routing via any particular junction point or delivery by some particular connecting line, he should ascertain whether the lowest rate is applicable over the desired routing or not. A low commodity rate may apply only via some one of several possible junction points; and several tariffs may have to be consulted if there are several connecting lines which serve the desired destination. If a through commodity rate does not apply via the desired junction, the shipment must move under a through class rate or the lowest combination of local rates.

7. We are now ready for the last step—the finding of the rate itself. Here we must, first, be sure that we have the latest issue of, or supplement to, the tariff, and second become familiar with the scheme of quoting the rate. As to the former point, it is to be remembered that as many as three supplements may be in effect and that these may cancel or change the original rate or the rules governing its application. As to the schemes of quoting rates, there are several and some are complicated. The most common ones are as follows:

(a) Rates are sometimes quoted in cents per 100 pounds, or dollars per ton between specified stations or groups of stations. Such tariffs are illustrated by the tables in Figs.

24a and 24b, the first being a class tariff; the second, a commodity tariff. Thus, if station No. 110 is Bloomsbury, N. J., the rate, 1st class, from Weehawken is 74 cents.

	FROM	To Stations Taking Following Index Numbers:	RATES IN CENTS PER 100 POUNDS							
	Stations on N. Y. O. and W. Ry.		CLASSES							
Index Nos.	STATIONS		1	2	3	4	5	6	Rule 25	Rule 26
13 to 48 inc.	Weehawken....N. J. Port Jervis....N. Y.	13 to 18, inc...	74	63	52½	38	31½	28	53½	42
		19 and 20......	63	55½	46	34½	28	24	47	37
		21 to 190, inc...	74	63	52½	38	31½	28	53½	42
		191 to 278, inc...	84	74	63	49	42	38	63	50½
		279 to 381, inc...	74	63	52½	38	31½	28	53½	42
		382 to 405, inc...	84	74	63	49	42	38	63	50½
		406 to 442, inc...	74	63	52½	38	31½	28	53½	42

Fig. 24a.—A Class Tariff

N. Y., Ont. & W'n Ry. Joint Freight Tariff No. 103 (4th revision) (I.C.C. No. 8742; P.S.C.–Pa. No. 638): Class rates applying from stations on the N. Y., Ont. & W'n Ry. and Unadilla Valley Ry. to stations on the Central R. R. of N. J., Del. Lack. & W'n, etc.

GEOGRAPHICAL LIST OF STATIONS ON NEW YORK CENTRAL RAILROAD CO. TO WHICH RATES APPLY AND RATES
(From Pa. mines on N. Y., Ont. & W'n Ry.)

Index Nos.	STATIONS	Route Letter	RATES PER 2,240 LBS.		
			Prepared Sizes and Briquettes	Pea	Boiler Buck No. 1 and smaller sizes
	Hudson Division MAIN LINE				
352	130th Street............N. Y.	I	$3.92	$3.78	$3.50
353	Ft. Washington.........N. Y.				
354	Inwood.................N. Y.				

Fig. 24b.—A Commodity Tariff

N. Y., Ont., & W'n Ry. Joint and Proportional Freight Tariff No. B. 377 (I.C.C. No. 8597, C. R. C. No. 711) applying on Anthracite Coal and Briquettes in carloads.

(b) Instead of showing rates in connection with the list of stations, "rate reference numbers" may be shown and a separate table of rates be presented. Thus the exhibits in Figs. 25a and 25b show that the rate from New Rochelle,

Index No.	From To	Nemasket........Mass. 133	Neponset........Mass. 371	New Bedford........Mass. 547	New Britain........Conn. 561	New Canaan........Conn. 26	New Hartford........(C.N.E.)..Conn. 719	New Hartford (N.Y.........N.H.&H.)..Conn. 137	New Haven........Conn. 125	Newington........Conn. 167	New Lenox........Mass. 96	New London........Conn. 221	New Milford........Conn. 74	Newport........R.I. 536	New Preston........Conn. 66	New Rochelle........N.Y. 11	Newton Upper Falls..Mass. 630	Newtown........Conn. 59	N.Y.Sta.(Note E) (N.E.S.S. 853A to 853F, Inc.........N.Y.	N.Y.Sta.(Note F) (N.Y.N.H. 4 to 1C, Inc.....&H.) N.Y.	N.Y.Har. Lighterage Pts. 1-851 (Note A). N.Y.
		Rate Reference Numbers (For table of Class Rates, see pages 529 to 532 inc.)																			
	N. Y., N. H. & H. R. R.																				
46	Green's Farms................Conn.	28P	27P	28P	11	5	14	14	5	12	22N	16	9	28P	11	7	26P	6	10	10	109
47	Southport....................Conn.	28P	27P	28P	11	5	14	14	5	12	22N	15	9	28P	11	7	26P	6	11	11	109
48	Fairfield....................Conn.	27P	27P	28P	11	6	14	14	5	11	22N	15	9	28P	10	7	26P	5	11	11	110
49	Bridgeport...................Conn.	27P	27P	28P	10	7	13	13	4	10	21N	14	8	27P	9	8	25	4	12	12	111

Fig. 25a.—A Class Tariff using "Route Reference Numbers"

(See Fig. 25b for table of rates)

N. Y., N. H. & Hart. R. R. Local, Joint, and Proportional Class Rate Tariff (I. C. C. No. F. 2424; R. I. P. U. C. No. 464; P. S. C.–1 N. Y.–No. F. 284; P. S. C.–2 N. Y.–No. F. 379) applying locally or jointly from or to stations on lines of Central New England Ry. Co., Narragansett Pier R. R., etc.

RATE TABLE

RATE REFERENCE NUMBERS (See Fig. 25a above)	CLASS RATES IN CENTS PER 100 POUNDS								
	CLASSES								
	1	2	3	4	5	6	Rule 25	Rule 26	Rule 28
1	35½	30	24	18	12½	10	25½	19	20
2	38½	32½	26	19½	13½	11	27½	21	22
3	40½	34½	27	20½	14	11½	29½	21½	23
4	42	35½	28	21	14½	12	30	22½	23½
5	45	38½	30	22½	16	12½	32½	24	25
6	46	39	31	23	16	13	33	25	26
6A	46	39	31	23	16	13	33	25	26
6J	45	39	31	23	16	13	33	25	26
7	48½	41	32½	24½	17	13½	35	26	27½
7A	48½	41	32½	24½	17	13½	35	26	27½
7I	48½	40½	32½	24½	17	13½	34½	26	27½
7K	48½	41	32½	24½	17	13½	35	26	27½
8	51	43½	34	25½	18	14½	37	27	28½
8A	51	43½	34	25½	18	14½	37	27	28½
8I	51	40½	34	25½	18	14½	34½	27	28½
8K	51	43½	34	25½	18	14½	37	27	28½
8L	51	43½	34	25½	18	14½	37	27	28½
9	52½	44½	35	26½	18½	14½	38	28	29½
9I	51	40½	34½	26½	18½	14½	34½	27½	29½
9K	52½	44½	35	26½	18½	14½	38	28	29½
9L	52½	44½	35	26½	18½	14½	38	28	29½
10	54½	46½	36½	27½	19	15½	39½	29	30½

Fig. 25b.—Table of Rates for use with Rate Reference Numbers

(See Fig. 25a)

N. Y., to Bridgeport, Conn., (rate reference No. 8) was 51 cents per 100 pounds, 1st class.

(c) Sometimes rates are quoted on a mileage scale basis. It is then necessary to consult a table of freight distances to determine the amount of the rate between any two stations. Such tables are published by the carriers, and the *Official Guide* is often used. Thus according to the table shown in Fig. 26, the rate on common building brick between any two stations involving a haul of not less than 20 miles nor more than 25 miles would be 6 cents per 100 pounds. The exception referred to is a provision that the rate to New York lighterage points is made by adding an arbitrary of 3 cents to the mileage rate to Harlem River, N. Y.

General Comment on Use of Tariffs.—As the author has elsewhere written, "Contrary to the common belief it is generally not difficult to look up a rate when the route is not in question. Indexes may be found in the front of the tariff which list the stations from and to which rates are quoted. To ascertain the rate the shipper merely finds the station from which rates are desired in an alphabetical list of stations, and then refers to the alphabetical index of stations to which rates apply. An index number is often prefixed to the latter point which enables one to turn to the page on which is given the rate or a reference number to a table of rates. A little study on the part of an intelligent person will enable him to look up a rate in a short time. The real difficulty in looking up railway rates arises from the fact that tariffs are constantly being issued and cancelled so that the shipper who is not an expert is uncertain as to whether he has all the tariffs which may apply. Some through rate may exist of which he does not know, or there may be a choice of routes of which he is not advised. It is therefore generally the part of wisdom

RATE TABLE

Mileage Rates applying locally or jointly between stations on the Central New England Ry. and New York, New Haven & Hartford R.R. and jointly between said stations and stations on the Moshassuck Valley R. R., New York Connecting R. R. and Rhode Island Co., except as otherwise indicated.

DISTANCES IN MILES. (To obtain Distances between any two stations, see Rules Governing Tariff, page 14.)	MILEAGE RATES IN CENTS PER 100 POUNDS, UNLESS OTHERWISE STATED, APPLYING ON (See Exception).													
	BRICK, Common Building, Hollow, Paving, or Sand Lime: BLOCKS, Common Clay Partition; TILE, Building, hollow; Carloads, minimum weight 60,000 pounds except as otherwise indicated. (See Notes B and C.)	CEMENT, Hydraulic, Natural or Portland, from Beacon N. Y. Carloads, minimum weight 50,000 pounds. (See Note B.)	COKE (all kinds), carloads, minimum weight 18 net tons of 2,000 pounds except where cars are furnished that will not permit of loading to 18 net tons of 2,000 pounds when loaded to full visible capacity, in which case the minimum will be 15 net tons of 2,000 pounds. (Except from Harbor Jct. Wharf, R. I.) (See Note B.)	COKE (all kinds) from Harbor Junction Wharf, R. I., to Stations on Central New England Railroad, New York, New Haven & Hartford Railroad, Wood River Branch Railroad New York Connecting Railroad, Moshassuck Valley Railroad and Rhode Island Company.	ICE, carloads, minimum weight 20 net tons of 2,000 pounds.	Group A. BILLETS, BLOOMS, SCRAP IRON, ETC. Applying on Articles named and described in Official Classification under caption "Iron and Steel and Articles Manufactured of Same," Classified 6th Class, carloads (except articles named in Lists B and C). Also the following articles in carloads, viz.: CRUCIBLES, Old, Broken; IRON MASS; IRON SPONGE, AND SULPHATE OF IRON (Copperas). Group B. IRON, Pig, in carloads. Group C. MILL CINDER AND SCALE, iron or steel in carloads.								
						TO AND FROM All stations other than New York Harbor Lighterage Points. Brooklyn, Long Island and New York Stations. (Index Nos 2 to 40 inc.)			TO AND FROM Brooklyn, Long Island and New York Stations. (Index Nos. 2 to 40 inc.)			TO AND FROM New York Harbor Lighterage Points. Index No. 1		
						GROUPS			GROUPS			GROUPS		
						A	B	C	A	B	C	A	B	C
Not Over 5 miles	5	6½	4½	4½	4	4½	4½		...	...	...	...	...	....
Over 5 not over 10	5	6½	4½	4½	4	5½	5½	5½	7½	7½	7½	10	10	10
" 10 " " 15	5½	6½	5	5	4	5½	5½	5½	7½	7½	7½	10	10	10
" 15 " " 20	5½	6½	5	5	4	5½	5½	5½	7½	7½	7½	10	10	10
" 20 " " 25	6	6½	5½	5	4	7½	7½	7½	7½	7½	7½	11½	11½	11½

Fig. 26.—A Mileage Scale Tariff of Commodity Rates

N. Y., N. H. & Hart. R. R. Local, Joint, and Proportional Commodity Tariff (I. C. C. No. F. 2400; R. I. P. U. C. No. 421). Applying on various commodities from and to stations on the N. Y., N. H. & Hart. R. R., Cent. New England Ry., N. Y., Westchester & Boston Ry., etc.

for a shipper to consult an expert traffic man in such matters."[3]

For those who desire the easiest possible way to ascertain approximate rates, various unofficial concerns have prepared "freight rate guides," the best known of which is *Hartman's Western Freight Rates.* These enable one readily to look up freight rates between the chief points. Another convenient aid is found in the "Rate Bases and Billing Instructions" issued by agents for various fast freight lines. These give terminal and special service tariffs, lists of stations on connecting lines, and rate bases for such points, and many rules and regulations concerning routing and shipping freight.

It is impossible to learn all about how to use tariffs from reading about them in a book. Much experience with traffic and rate matters is required to make the expert "rate man." This chapter, however, together with those on Classification and Rate Territories, will furnish a foundation and a knowledge of terminology of practical value.

The Routing of Freight

Importance of Routing.—The matter of routing freight, which is often of great importance to the shipper, is closely connected with tariffs. When there is only one line of transportation between the two points involved, there is no problem of routing; but such is not generally the case. Not infrequently between large centers there may be at least a dozen different routes, including rail, rail-and-water, and water routes. Not only may it be possible to ship by six or eight different railway lines, but several of the railways may each be able to handle the shipment by two or more different routes, no two of which may be exactly the same in the time required, and some of which may involve a greater charge than others, either in the shape of a higher rate or additional charges for terminal services, etc.

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[3] Haney, *Railway Traffic and Rates* (Philadelphia, 1921.)

Chief Factors in Routing.—In brief outline, the chief factors which have to be considered in choosing the route are as follows:

1. *The rate.* Routing is often determined by the fact that a lower rate is secured over one route than another. Often there is a possibility of shipping by some combination of rail and water at a saving in the freight charges. By one route there may be a through rate which is lower than the combination of local rates which would apply on other routes. Between Chicago and New York there are "standard" lines and "differential" lines, the latter offering lower rates. From the New York rate group in Trunk Line Association Territory it has been the case that freight routed over the Ulster and Delaware Railway via Kingston, N. Y., would take the New York rate plus an arbitrary, while if the freight were routed by Oneonta, N. Y., it would take the Albany rate plus an arbitrary.

2. *Time required for delivery.* In many cases the shipment must go through as quickly as possible, and it may then be desirable to ship over the route which insures the quickest delivery, even though the rate is higher. This often prevents the use of rail-water routes, and the more circuitous all-rail ones or those which involve transfers.

3. *Location of terminals.* The freight station or the team track of one railway may be nearer to the consignee than those of several others which might be used, and in this case the convenience for inspecting the shipment on arrival and the cartage charges may be a decisive factor.

4. *Damage to shipment.* Some routes involve so much switching or transfer that their use increases the likelihood that freight will be damaged in transit. It may be that the carrier in question does not have so good a reputation for careful handling of freight. Especially when the goods are fragile, this factor will be important.

5. *Availability of special services.* Of several routes that may be possible, one only may make available certain special facilities or services such as elevators or arrangements for milling in transit.

6. Routes differ in the *courtesy, reliability,* and *general efficiency* of service on the part of the companies involved. Some companies have a just reputation for prompt and satisfactory dealing with such matters as loss and damage claims and tracing shipments, to say nothing of promptness of supplying adequate equipment.

7. *Embargoes* may exist on some routes.

What a Shipper Should Know about Routes.—Each of the foregoing factors has its importance, depending upon the kind of shipment and the requirements of the shipper or consignee. The choice of the route cannot be left to the carrier. Not infrequently the carrier's agent through ignorance or carelessness gives incorrect advice, while the self-interest of the carrier may lead it to favor some one connecting line over another, or to route the shipment in such a way as to insure the longest haul over its own line when transfer to a connection at some nearby junction point would afford the best route.

It is highly important, therefore, that the shipper should be well posted in a number of ways. He should know all the possible routes between the points of origin and destination. He should also know all the factors which bear upon the relative desirability of these routes, such as the various joint and combination rates which obtain, shipping time, the number of times less-than-carload freight has to be handled, the schedules of merchandise cars, and the location of terminals with reference to the consignee's place of business. He should also be advised of congested conditions or embargoes which may affect any particular route. Finally, there is the question of his rights under the law. As we shall see, there are laws and many Commission rulings pertaining to this matter. These various things traffic men will partly learn from a study of the tariffs and basing and billing books issued by the carriers, but partly only by experience. The chief service that can be rendered by a book such as this is to outline the rights and duties of the parties interested in the shipment.

The Shipper's Rights.—In general, we may say that the shipper has the right to determine the routing of his shipment, including its movement over connecting lines and the terminal delivery. He should indicate on the bill of lading what route he desires to follow, and it is the duty of the carrier to observe it if practicable. For example, a carload of lumber was shipped from a North Carolina point, billed to the West Eighth Street station at Bayonne, N. J. It moved over the Southern and Pennsylvania railways as routed, but upon arrival at Bayonne it was delivered by the Pennsylvania to a short terminal railway which does not serve the West Eighth Street station. This made necessary an extra movement over the Central of New Jersey, which was the only carrier that could make the required delivery. The Interstate Commerce Commission held that the shipment had been misrouted by the Pennsylvania and that carrier was required to refund to the shipper the excess charges together with the interest thereon.[3]

The Interstate Commerce Act provides that when there are two or more through routes and through rates, the shipper "shall have the right to designate in writing by which of such through routes such property shall be transported to destination, and it shall thereupon be the duty of the initial carrier to route said property and issue a through bill of lading therefor as so directed." The shipper may direct terminal routing or delivery on shipments going beyond the line of the initial carrier and his directions must be observed.

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[3] 59 I.C.C. 139.

Limitations on the Shipper's Rights.—A number of restrictions, however, limit the shipper's right to determine routing. In the first place, the Interstate Commerce Commission retains great power over the routing of freight. Whenever the Commission is of the opinion that any railway engaged in interstate commerce is unable to transport traffic offered to it so as properly to serve the public it may make such changes in the routing of the traffic as, in its opinion, will best promote service of the public.[4] In 1922, when there was great congestion on the railways, the Commission acted under this authority and authorized the railways to handle freight over the least congested routes no matter what routing had been designated by the shipper.

In case of physical necessity, too, the carriers may forward freight over any route between points of shipment and the point of destination, regardless of the shipper's routing instructions. When a connecting line is obstructed, as by a flood or washout, the initial carrier may advise the shipper and secure instructions as to new routing, meanwhile charging local rates to the junction and beyond.

Another point to observe is that if the tariff under which the goods are shipped specifies a certain routing, the rate applies only to that route and may not apply via routes which are not specified.

Of course there is no choice in routing when there is only one route available, and the right given to the shipper under the Interstate Commerce Act to designate in writing by which through route his property shall be transported applies only when "two or more through routes and through rates shall have been established as in this act provided to which through routes and through rates such carrier is a party."

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[4] Interstate Commerce Act, Section I, par. 16.

The Carrier's Duties as to Routing.—Subject to the foregoing limitation, not only has the shipper the right to determine his routing, but the law steps in to protect him in several ways. In the absence of specific through-routing instructions by the shipper, it is the duty of the carrier to route shipments by the cheapest reasonable way, and when the carrier sends shipments via routes that are more expensive than others available (whether designated by the shipper or not), the excess may be refunded as an overcharge. Thus, if the freight is not routed by the shipper and if no through rate is in effect, it is provided that the lowest combination of rail rates between any two points shall apply over all rail routes of the same class between such points.

For example, in a case decided in 1920, it appeared that two routes were available, in connection with the Chicago, Burlington and Quincy, between Milwaukee and a certain town in Iowa, one via Sterling, Ill., over which a joint 5th class rate of 27 cents was applicable, and another via Chicago over which a combination of commodity rates was in effect, aggregating 18.75 cents. The shipper delivered a carload of oatmeal at Milwaukee without any specific routing and the railway hauled the car via Sterling charging him the higher class rate. The Commission decided that in the absence of specific routing instructions it was the duty of the carrier to forward the shipment via the cheapest available route consistent with the instructions given, which in this instance was via Chicago.[5]

Another point to note here is that even when the Commission re-routes freight under the emergency powers given by the Interstate Commerce Commission Act the *rate* which applies over the route that was designated by the shipper will be protected, and in case the shipper designates no route, the rate will be that applying over the cheapest route.

Carrier's Duty to Advise Shipper.—It is the carrier's duty to advise the shipper correctly concerning the rates applying over different available routes. Thus, a shipper of crushed stone, located at a point near Joplin, Mo., shipped over the Missouri, Kansas and Texas two carloads to Lincoln, Neb., and was advised by the carrier's agent at Joplin that a rate of 7.5 cents would apply, this rate being the same as that in force on other routes from Joplin. As a matter of fact, the carrier assessed a charge of 13.5 cents, this being the joint Class E rate which was properly applicable. The Commission ruled that the shipment had been misrouted by the carrier and that reparation was due to the shipper on the ground that if the station agent had directed his attention to the fact that the 7.5-cent rate did not apply over the route specified, he might have secured the benefit of a combination rate of 10 cents, composed of rates of 2.5 cents into Joplin, Mo., and 7.5 cents from Joplin to Lincoln, Neb.

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[5] 59 I. C. C. 163.

If both all-rail and rail-water routes are available, it is the carrier's duty to ascertain from the shipper which kind of routing he desires, but it is apparently not necessary that the carrier should route rail-water unless required to do so by the shipper.

Bill of Lading Must Be Feasible.—It is one of the carrier's obligations to see that the bill of lading is so executed as to be feasible. The carrier should refrain from executing a bill of lading which contains provisions that cannot lawfully be complied with or are contradictory. When a shipper noted a through rate on his bill of lading which did not apply via the route he specified, and the carrier's agent did not advise him of the fact, the carrier was required to refund for the high charges that resulted from following the route specified. Not infrequently, through some mistake on the part of the shipper, the bill of lading specifies a routing and a rate which are in conflict, in that the rate given does not apply over the route specified. In such cases the carrier's agent is obligated to find out from the shipper which of the two conflicting instructions should be followed, and the carrier will be held responsible for damages if the agent fails to take this course. Should the carrier with reasonable diligence fail to get instructions, it is its duty to forward the shipment by the route specified in the bill of lading, assessing the correct rate in force over that route.[6]

Routing Sometimes Best Left to Carrier.—Sometimes it is better to leave the routing of the freight to the carrier. At least, the shipper has been held responsible for the assessing of a higher rate when it resulted from his own specific routing. This is illustrated by the *Dort Motor Car Company* case (59 I.C.C. 374). Thirty-five carloads of gasoline engines were shipped from Williamsport, Pa., to Flint, Mich., moving over the Pennsylvania Railroad to Buffalo, and over the Pere Marquette Railway beyond. No joint freight rate applied over this route, and a combination 5th class rate of 32.6 cents was collected. Lower joint rates of 22.3 cents were in force via several other routes, but when the shipments moved, these other routes were embargoed on account of congestion of traffic. Presumably on this ground, the shipper had specifically instructed that the routing should be that which was actually taken. In spite of the higher rate, therefore, the Commission dismissed the complaint.

The Commission's Power over Routing.—The Transportation Act of 1920 gave the Interstate Commerce Commission increased power with regard to routing. As already noted, in emergency the Commission can determine the routing of freight and it can open new through routes. It can also direct the route which traffic shall take after it arrives at the terminus of one carrier or at the junction point of another carrier, when the traffic is not routed by the shipper.

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[6] Conference Ruling, 474 c.

CHAPTER XX

CHIEF FREIGHT RATE TERRITORIES AND TRAFFIC ASSOCIATIONS

Railway Geography.—We have seen that the railways of the United States may be divided into groups either on a purely geographical basis or upon the basis of their operating and traffic characteristics, and the chief groups, according to the latter basis, have been discussed. These groups are fundamental, resting as they do upon industrial and physiographic conditions. In addition to these groups, however, there are others which are more immediately connected with rate making problems and the basis for which lies in the uniformity of freight rates. To a great extent the freight rate territories are similar to the areas already discussed, but there are some differences and subdivisions.

Attention is again called to the importance of the general subject of railway geography. The rate territories about to be mentioned are in many respects more important than states, but do not conform to state lines. The making of railway freight rates within these territories has a profound effect upon the industrial and economic well-being of the population therein, and it would be well if, in this democracy of ours, the citizens were more generally familiar with the fact that they live not only in some particular state but also in some railway freight rate territory and are subject to the laws of the latter in a very real sense.

The Chief Rate Territories.—The United States is divided into seven chief freight rate territories (Fig. 27). The differ-

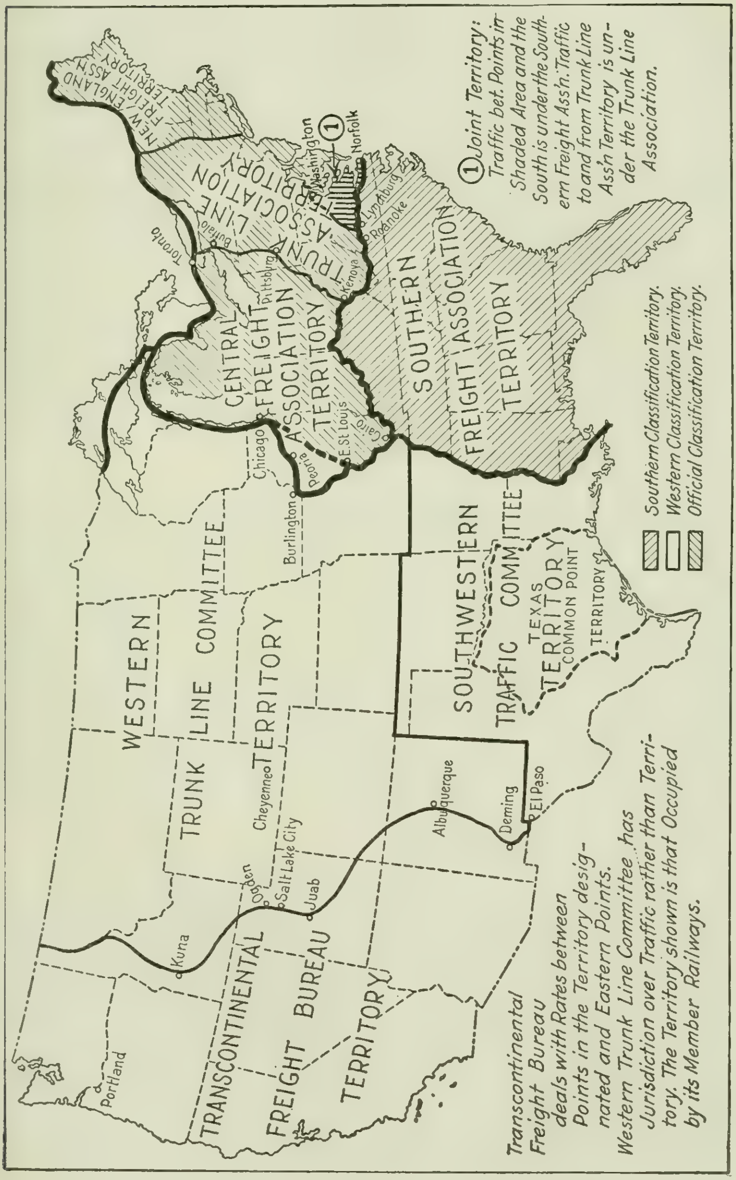
NEW ENGLAND FREIGHT ASS'N TERRITORY
TRUNK LINE ASSOCIATION TERRITORY
CENTRAL FREIGHT ASSOCIATION TERRITORY
SOUTHERN FREIGHT ASSOCIATION TERRITORY
WESTERN TRUNK LINE COMMITTEE TERRITORY
SOUTHWESTERN TRAFFIC COMMITTEE TERRITORY
TEXAS COMMON POINT TERRITORY
TRANSCONTINENTAL FREIGHT BUREAU TERRITORY
Toronto
Buffalo
Washington
Norfolk
Lynchburg
Roanoke
Kenova
Pittsburg
Chicago
Peoria
E. St Louis
Cairo
Burlington
Cheyenne
Ogden
Salt Lake City
Juab
Kuna
Portland
Albuquerque
Deming
El Paso
① Joint Territory: Traffic bet. Points in Shaded Area and the South is under the Southern Freight Ass'n. Traffic to and from Trunk Line Ass'n Territory is under the Trunk Line Association.
Transcontinental Freight Bureau deals with Rates between Points in the Territory designated and Eastern Points.
Western Trunk Line Committee has Jurisdiction over Traffic rather than Territory. The Territory shown is that Occupied by its Member Railways.
▨ Southern Classification Territory.
☐ Western Classification Territory.
▨ Official Classification Territory.

Fig. 27.—Chief Classification and Rate Territories of the United States

ent sections of the country have different traffic and operating conditions, depending upon different climates, soil, mineral resources, population, and industrial development. Accordingly, the carriers operating in the different sections have been led to establish freight rate structures which are adapted to local conditions; and competition, combined with government regulation, has practically compelled uniformity within each territory. The establishment of these rate structures within the several territories has been effected by traffic associations or traffic bureaus, representing the various railway companies concerned. Each territorial rate structure has a characteristic rate basis or group of rate bases, which will be analyzed and described in the several chapters following.

1. **New England Freight Association Territory.**—The first of the freight rate territories to be mentioned is that of the New England Freight Association, a territory which coincides almost exactly with that occupied by the New England group of railways. This territory includes all of the New England states and a few points in New York which lie east of the Hudson River. These New York points lie on the Boston and Albany, the Boston and Maine, and the New Haven, but do not include New Rochelle, N. Y., on the last-named road, nor points west thereof.

2. **Trunk Line Association Territory.**—The territory in which the Trunk Line Association makes rates does not coincide with that occupied by the Trunk Lines discussed in a preceding chapter, but includes the eastern half of that territory, all the anthracite, and part of the Pocahontas roads. The entire territory occupied by the Trunk Lines is too large and diversified to be handled under one rate structure. In general, it may be said that the Trunk Line Association rate territory includes the eastern half of the area between New York and

Chicago. To be more precise, this territory lies west of the New England Freight Association's territory, south of Canada, and has as its western boundary a line drawn from Buffalo through Salamanca, N. Y., to Pittsburgh and thence through Wheeling, W. Va., to Kenova on the Kentucky-West Virginia line. The southern boundary runs east from Kenova through Roanoke and Petersburg, Va., to Norfolk. The territory thus includes all of New Jersey, Delaware, and Maryland, and all but a small western slice of New York, Pennsylvania, and West Virginia. The northern half of Virginia is also included.

The "Buffalo-Pittsburgh line" is one of the most important boundaries on the railway traffic map, and marks the division between the railways' east and middle west. Buffalo is at the head of lake navigation and is the point where grain moving by rail and lake is transshipped; Pittsburgh is at the head of navigation on the Ohio River; consequently, to the west of the line referred to water competition introduces a new factor.

It will be noted that the southern boundary extends through "the Virginia cities" and lies south of the Potomac River. These cities are the rail gateways to the South, and it has long been a practice to base rates upon them.

3. **Central Freight Association Territory.**—The western half of the Trunk Lines is covered by the Central Freight Association Territory, which extends from the Buffalo-Pittsburgh line to the Mississippi River, including Chicago and St. Louis. To be more exact, however, it must be noted that the eastern boundary of Central Freight Association Territory differs somewhat from the western boundary of the Trunk Line Association Territory, in that at the southern end it overlaps, slightly extending from Point Pleasant, W. Va., to Gauley in the same state. On the south this territory is bounded by

a line running from Gauley, W. Va., to Ashland, Ky., thence down the Ohio River to the Mississippi, but including the cities of Louisville and Paducah, Ky. The western boundary follows the west bank of the Mississippi River north to East Burlington, Ill., and thus includes the city of St. Louis. Thence the line runs through Peoria and Joliet, Ill., to Chicago and along the western shore of Lake Michigan to Manistique. On the north the territory is bounded by the Straits of Mackinac and Lake Huron. It includes Ontario south of a line drawn from Sarnia to Toronto.

4. Southern Freight Association Territory.—The articles of association of the Southern Freight Association provide that its jurisdiction shall include the railways east of the Mississippi River and south of the Ohio River whose rates are governed by the Southern Classification. The territory, therefore, is much the same as Southern Classification Territory (see page 329), and embraces the old South. It covers all of the following states: North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and Tennessee. The greater part of Kentucky also falls under the jurisdiction of the Southern Freight Association as does a large part of Virginia, and a small part of southeastern Louisiana.

No part of West Virginia is included; nor is the line of the Chesapeake and Ohio in Kentucky. In Virginia, the association's jurisdiction is complete south of the line of the Norfolk and Western railway running through Lynchburg and Roanoke (see Figs. 15 and 30), and extends over the lines of the Atlantic Coast Line, the Southern, the Seaboard Air Line, and the Norfolk and Southern.

Within Southern Freight Association Territory there are three chief rate adjustment territories, which correspond to some extent with three freight associations which the Southern Association has superseded.

1. *Southeastern Territory,* lying south of Kentucky, west of North Carolina and South Carolina, and east of a line from Paducah, Ky., through Jackson and Meridian, Miss., to Mobile, Ala.

2. *Carolina Territory,* embracing North and South Carolina and part of Virginia lying south of the line of the Norfolk and Western railway from Bristol, Tenn., through Lynchburg and Roanoke to Norfolk.

3. *Mississippi Valley Territory,* lying west of Southeastern Territory, and east of the Mississippi River (see Fig. 30). Mississippi Valley Territory includes a small part of western Kentucky and of eastern Louisiana.

5. **Western Trunk Line Committee Territory.**—The territory of the Western Trunk Line Committee embraces a large area west of Lake Michigan, centering around the Missouri River valley. Its territorial boundaries are indefinite,[1] but it may be said to include northwestern Illinois, Wisconsin, north Michigan, Minnesota, Iowa, Missouri, Kansas, Nebraska, and partial jurisdiction in North Dakota, South Dakota, Colorado, Wyoming, and part of Utah. The bulk of this territory corresponds with that occupied by the Granger lines.

6.. **Southwestern Freight Bureau Territory.**—This territory is distinct only for certain classes of traffic. Its chief significance is for interstate traffic between points in Oklahoma, Arkansas, Texas, and Louisiana (west of the Mississippi River), and may be said to occupy the states mentioned. Southwestern Freight Bureau rates also apply on traffic from Chicago and St. Louis Territory into southeastern Missouri points.

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[1] Perhaps the best way to indicate the territory of this association is to list the member railways, which are as follows:

Atchison, Topeka & Santa Fe R'y.
Chicago & Alton R. R.
Chicago & North Western R'y.
Chicago, Burlington & Quincy R. R.
Chicago Great Western R. R.
Chicago, Milwaukee & Gary R'y.
Chicago, Milwaukee & St. Paul R'y.
Chicago, Rock Island & Pacific R'y.
Chicago, St. Paul, Minneapolis & Omaha R'y.
Colorado Southern R'y.
Denver & Rio Grande Western R. R.
Elgin, Joliet & Eastern R'y.
Ft. Dodge, Des Moines & Southern R. R.
Illinois Central R. R.
Kansas City Southern R'y.
Los Angeles & Salt Lake R. R.
Minneapolis & St. Louis R. R.
Minneapolis, St. Paul & Sault Ste. Marie R'y.
Missouri, Kansas & Texas R'y.
Missouri Pacific R. R.
Oregon Short Line R. R.
Quincy, Omaha & Kansas City R. R.
St. Joseph & Grand Island R'y.
St. Louis-San Francisco R'y.
Union Pacific R. R.
Wabash R'y.

7. **Transcontinental Freight Bureau Territory.**—This territory, roughly speaking, occupies the Pacific slope, extending from the Canadian boundary on the north to the Mexican border on the south. The eastern edge follows the eastern and southern boundaries of Montana, straight across Idaho to the Oregon line; thence south on the Idaho-Oregon line to Nevada; thence southeast along an irregular line drawn just west of Salt Lake City, Utah, and Albuquerque, N. M., to the neighborhood of El Paso, Tex.

The chief significance of the Transcontinental Freight Bureau, however, is not territorial but lies in the traffic over which it has jurisdiction. It concerns traffic between the entire eastern part of the United States (east of Arizona, Utah, Wyoming, and North and South Dakota) and Pacific Coast and intermediate points. It does not have jurisdiction *within* the territory as defined in the preceding paragraph, but *between* that territory and eastern territory as described above.

The **Pacific Freight Tariff Bureau** issues tariffs covering a territory lying west of a line from Cheyenne, Wyo., to El Paso, and south of a line from San Francisco through Ogden to Cheyenne. It thus includes all of Arizona, large parts of California, Nevada, and Utah, and smaller portions of Wyoming, Colorado, and New Mexico. Its jurisdiction also embraces a strip of the Pacific Coast from San Francisco to Portland, Ore.

The **North Pacific Coast Freight Bureau** publishes local and interstate rates between points in Washington, Oregon, and Idaho.

Minor Rate Territories.—The foregoing freight rate territories cover the whole area of the United States. The chief ones of these territories will be taken up in the following chapters and the main characteristics of the rate structures therein examined.

It must not be supposed, however, that the foregoing are the only rate territories in existence. As a matter of fact, lying within the seven great areas there are scores of minor divisions or territorial groupings made for various special purposes. These are variously known as "common point territories," "prorating territories," "percentage territories," and "rate groups." Thus there is the Texas Common Point Territory which occupies the whole eastern half of Texas and which is so called because it contains the points at which various rail carriers from the North, East, and Gulf compete for traffic. Rates between any point in this territory and points lying east of the Missouri and Mississippi rivers are generally the same. To the west of Texas Common Point Territory lies a "differential territory," to which rates are made by adding arbitrary amounts to the common point rates.[2]

In Trunk Line Association Territory, as we shall see, there are various separate rate groups for traffic with points in Central Freight Association Territory, such as the Albany rate group, Syracuse rate group, etc.

These minor territorial divisions are mentioned merely to guard the reader against the idea that the seven great rate territories constitute the whole of railway rate geography.

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[2] For a brief description of the Texas rate structure see Haney, "Railway Regulation in Texas," *Journal of Political Economy*, vol. XIX, pages 441-447.

Freight Traffic Associations and Agency Tariffs.—In the Official Classification Territory an organization known as the Traffic Executive Association exists. It represents Traffic Executive Committees in New England, Trunk Line Territory, and Central Freight Association Territory. Each one of these Traffic Executive Committees, in turn, has under its supervision a Freight Association and a Passenger Association. Much the same situation is found in the other two great classification territories. Thus in each of the chief rate-making territories described in the foregoing pages, there is a "Freight Traffic Association" comprising most of the railways in the territory. These associations deal with such traffic and rate matters as may be handled jointly. Their function is to deal cooperatively with the establishment and publication of rates, the division of interterritorial through rates, freight inspection, and traffic rules and regulations.

Functions.—Their chief function is the control of joint through rates, which necessitate the concurrence of connecting lines, thus requiring joint action. These rates are published in the so-called "agency tariffs," which are issued by some one of the association officers—generally, though not always, the chairman—acting as the agent for the associated lines. As a result of the joint and simultaneous publication of rates, there is economy, as many separate publications are eliminated. This is a great convenience for shippers, in that they need only consult one tariff; and they can know that an agency rate generally goes into effect on all lines at the same time. Agency tariffs formerly concerned joint rates chiefly, local rates being found with few exceptions in the tariffs of individual lines. In most territories the tendency appears to be toward an extension of agency publication to cover local tariffs. The tariff publishing agent represents practically all lines in his territory.

Generally no agency rate is published until interested shippers have been given a chance to be heard. For this purpose a docket is maintained, and not only are shippers and associations notified directly, but the docket is also published in the "Traffic Bulletin." Most changes in agency tariffs are proposed by some individual member road and are the result of complaints or requests by shippers. In some cases proposals for change come directly from shippers. In important local areas there are District Committees which furnish a convenient contact between the shippers and the freight committee of the association.

A tariff publishing agent may represent several freight association territories, while some territories are subdivided into two or more parts each having a separate agent. The overlapping of agency tariffs is illustrated by the publications of agent E. B. Boyd of the Western Freight Traffic Bureau with headquarters at Chicago. He publishes a tariff covering points within Western Trunk Line Territory; one covering rates from Western Trunk Line points to points in Central Freight Association, Trunk Line, and New England Territories; and another from New Orleans rate points to Colorado and Utah common points.

The freight inspection service is important. It is generally carried on by inspection "bureaus," which, while distinct from the traffic associations, are closely related through the Traffic Executive Committees. Acting in lieu of individual lines, they undertake to inspect freight at terminals to see that rates, classifications, and weights are correctly applied, and they look into loss and damage matters.

The expenses of these traffic associations are met by the members on some agreed pro rata basis.

Legality of Traffic Associations.—The question is sometimes asked, Do the traffic associations not restrain trade? The answer must be that they exercise no unreasonable restraint and are socially desirable. By insuring a consideration of all elements in the situation, they serve to prevent cutthroat competition. They prevent discrimination, for if the several railways acted without cooperation, the large shipper could bring pressure to bear upon some particular carrier and secure concessions that would not be known for some time. They prevent wild fluctuation and make for reasonable stability in rates. They are desired by informed shippers. It may be added that these traffic organizations are unincorporated, voluntary associations. The Commission authorizes the activity of the tariff publishing agencies.

CHAPTER XXI

RATE STRUCTURES IN OFFICIAL CLASSIFICATION TERRITORY

1. The Central Freight Association Rate Structure

A Mileage Basis.—The Central Freight Association Territory has been defined, and it will be referred to hereafter as C. F. A. Territory, as is the custom among railway men.

In 1917, the Interstate Commerce Commission decided the now famous C. F. A. class scale case.[1] This decision put the class rates in C. F. A. territory on a mileage basis and established the application of the Official Classification within the territory. As will appear in a moment, a mileage basis means one in which rates increase in a regular way with distance; and the Official Classification is that division of freight into classes which applies throughout the whole northeastern part of the country.

Originally, the mileage basis of rates used was 16 cents per hundred pounds, 1st class, for a haul 5 miles or less in length, this rate to apply in the region having the densest traffic. The Central Freight Association had just completed a study of the cost of handling less-than-carload freight at terminals, finding an average of between 8 cents and 12 cents per hundred pounds. The Commission took these figures into consideration and added an allowance for cost of line-haul, general expenses, and profits. Additions were also made to allow for an increase in operating expenses which brought the total base rate up to 23 cents in 1918, with further advances subsequently. Thus the basis of the system was laid in cost studies and estimates.

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[1] I. and S. Docket 965.

Zones Based on Traffic Density.—The second great feature of the C. F. A. structure is a group of arrangements made to allow for differences in (1) traffic conditions, (2) class of freight, and (3) distance. In the *first place,* in order to allow for differences in traffic density, the whole C. F. A. Territory was divided into zones—Zones A, B, C, D, E, F. Thus Zone A embraces all the territory south of a line drawn from Chicago to Detroit, through Battle Creek and Ann Arbor, Mich., and accordingly comprises the area of densest traffic. Zone B takes in a slice of Michigan just north of Zone A, extending from Muskegon to Bay City, etc. Zones E and F concern Michigan intrastate rates only, and overlie the other zones in the state.

Zones B, C, and D provide for the decreasing density of traffic toward the northern part of Michigan. The northern part of the southern peninsula is but sparsely inhabited by a farming population, and even the agriculture is not very intensive. The tonnage mostly originates in the locality. Water competition by lake is very effective and cuts into the railway traffic. More than this, operating expenses are high by reason of the severe winters, the long haul required on coal, and the lack of solid trainload traffic.

Classification Scale.—In the *second place,* a standard spread among the different classes of freight was adopted and prescribed for that part of the territory in which traffic is densest. This classification spread was that known as the "Disque Scale"—a scale so widely applied that it should be of interest to note its construction. In it there are 6 numbered classes which have a percentage relationship as follows:

Class	1	2	3	4	5	6
Percentage	100	85	67	50	35	28

The classification spread prescribed for Zones C, D, E, and F, in which traffic is lighter, while based on the Disque Scale, was somewhat different, being determined by adding "arbitraries" in cents per hundred pounds. The addition of a certain number of cents to the several class rates resulted in a slight change in the class percentages applying in zones other than A and B.

Originally, the 1st class rate in Zone B was to be 2 cents higher than Zone A, but the Commission authorized an advance of 15% in rates before the scheme was established, and as finally announced the rate basis by zones was as follows:

Class	1	2	3	4	5	6
Zone A	18.4¢	85%	67%	50%	35%	28%
Zone B	20.7¢	"	"	"	"	"
Zone C amounts added to Zone B rates	+4.¢	+ 3.5¢	+ 2.5¢	+ 2¢	+ 1.5¢	+ 1¢
Zone D	+ 5.¢	+ 4.5¢	+ 3.5¢	+ 2.5¢	+ 2¢	+ 1.5¢

It will be seen that this advance destroyed the 2-cent differential between Zones B and A, which was originally planned, and subsequently percentage advances in rates have further modified the original relationship. Thus the 25% rate advance of 1918 made the 1st class rates in the several zones as follows: Zone A, 23 cents; Zone B, 25.8 cents; Zone C, 30.8 cents; Zone D, 32.3 cents.

Shipments made between zones take the highest rate applying in any zone traversed; a shipment from Zone A into Zone B, is billed at the higher Zone B rate.

Mileage Rates—Distance Zones and Blocks.—In the *third place* a graduated mileage scale of rates was established. By this is meant a scale of rates which increases with distance, but does not increase as rapidly as the distance, so that the average rate per mile for a long haul is less than for a short haul. For example, the C. F. A. Zone A rates, 1st class, as originally planned were as follows:

Distance Zones	Mileage Blocks	Rate per 100 lbs. within the Block
50 miles and less	5 miles	1c
50 miles to 100 miles	5 "	.5c
100 miles to 200 miles	10 "	1c
200 miles to 300 miles	10 "	.5c
300 miles and over	20 "	1c

The distance zones provide for hauls of different length. Thus a haul of 150 miles goes through an initial 50-mile zone, a second 50-mile zone, and halfway in a 100-mile zone. The "mileage blocks" provide steps for raising the rate per hundred pounds as distance increases. Thus within the first two 50-mile distance zones the freight charge is increased every 5 miles, there being no change between 5-mile points.

Let us take a concrete case to illustrate the working of this scheme. Suppose a 1st class shipment moving 55 miles in Zone A. The rate on the original basis would be 25.5 cents, made up as follows:

Base charge for initial 5-mile block	16c
Charge for remaining 9 blocks in first 50-mile distance zone, at 1c	9c
Charge for one block in 50-100 mile distance zone, at ½c	.5c
Total rate for 55 miles	25.5c

A "Tapering" Mileage Structure—Terminal Charges.—The result of this graduated scale, with its widening distance zones and mileage blocks and its varying rates per hundred pounds, is a "tapering mileage" rate structure—that is to say, the rate per hundred pounds tapers off as the distance increases. This general scheme has a wide use in various foreign countries, and has been adopted in several sections of the United States both by the Interstate Commerce Commission and by various state commissions for intrastate traffic. The scheme is, therefore, of great practical interest as being the leading method for standardizing railway freight rates on a distance basis.

It will be observed that one essential feature is to keep separate a charge to cover terminal costs, which costs are determined without reference to distance and consequently become a smaller and smaller amount per hundred pounds per mile as the length of the haul increases. This fixed terminal charge would in itself produce some "tapering" effect.

Exceptions to the Scheme—Basing Points and Rate Groups.—It is rare, however, that a scheme of rates can be applied rigidly in this country, and accordingly we find that even in C. F. A. Territory the rates are not all kept on a strict mileage basis. That basis is observed with reference to local rates, but in the case of inter-line traffic a system of "basing points" is used for the purpose of simplifying the tariffs. This usage is as follows: The principal towns which are junction points for two or more railways are made "basing points," and rates are quoted between such points. Shipments made between non-basing points are given the rates applying from or to the next basing point from which they are most distant. Thus, in the diagram shown in Fig. 28 a shipment moving from A to B is charged a rate from basing point 1 to basing point 3.

It also appears that some "rate groups" are retained to some extent in C. F. A. Territory. For example, the rates from Chicago to various "Buffalo-Pittsburgh points" are made on a uniform group basis; the rate is the same to Buffalo and

Pittsburgh although the distance to the former point is about 43 miles greater. This is a long-standing situation, caused by water competition to Buffalo.

The method followed by the railways in determining the application of rates is of interest as illustrating practical procedure in such matters. It has been the practice for representatives of competing lines to meet and make a rate check for the purpose of determining the short-line distance between various junction points and what distance group to use. Some of the railways may not participate, for the reason that, while their lines might be used, they are so circuitous that it would not pay them to take traffic between the points in question. If the short-line distance from St. Louis to Indianapolis is 242 miles, it is obvious that the 250-mile scale will apply, for the reason, first, that in the distance zone lying between 100 and 200 miles the mileage blocks are 10 miles long; and, second, the most distant point is taken as a basis. Through rates to intermediate points are made the same as that to the most distant of the two basing points between which they lie. The rates thus arrived at will be the minimum rates to intermediate points as far back as the next basing point which lies outside the same 10-mile block.

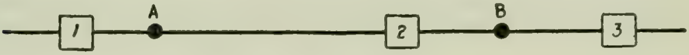

Fig. 28.—Diagram illustrating Use of Basing Points in Making Inter-line Rates

Inflated Mileage.—Competition somewhat modifies the simplicity of the system. One practice which should be understood is that of "inflating" or "averaging" railway mileage. For instance, if the basing point nearest to a destination is not highly competitive or important as a traffic center, the distance to it for rate-making purposes may be arbitrarily taken as greater than the actual distance. Such an arbitrary increase is called an inflated distance. If a town is 202 miles from the point of origin, it would ordinarily be given the 210-mile scale but for the reasons indicated, it may actually be quoted a rate based on the 230-mile scale. One object in inflating mileage has been to allow a circuitous route to participate in the traffic to a point at which its mileage is greater than that of competing roads. If the distance from points of origin to the 202-mile point is actually 230 miles by some circuitous route, the fact might constitute a reason for inflating the mileage via shorter competing lines to 230.

Commodity Rates.—What has been written thus far regarding rates in C. F. A. Territory concerns the basis of *class* rates, and it remains to note how the commodity rates are determined—an important matter in view of the large number of products which move under such rates. In all there are nearly a hundred commodities which receive special rates in this territory, among them, for example, being a number of heavy chemicals, such as muriatic acid, liquid ammonia, and calcium chloride; while the list contains such other products as asphaltum (N. O. S.),[2] coal tar pitch, straw board, and wood pulp. In many cases commodity rates in this territory are made as a percentage of class rates, and, accordingly, are virtually on a mileage basis. It is common for commodity rates so made to amount to between 85% and 90% of the 6th class rate, or, in other words, these commodity rates are from 10% to 15% below the lowest class rate. Other special rates, however, are made on a group of low-grade commodities, such as brick, cinders, clay, slag, and straw, without reference to the class rates and directly on a mileage basis.

Problem of Rates to Southern Points—Ohio River Crossings.—One of the great problems in C. F. A. Territory is to keep the several Ohio River gateways on a parity as regards traffic to the South. Of course, the local traffic from Chicago points to the Ohio River is involved. The "Ohio River Crossings" play an important part in the rate structure of both C. F. A. Territory and Southern Freight Association Territory. These crossings are divided into two groups, the "Upper Ohio River Crossings," which lie east of the Illinois-Indiana line, and the "Lower Ohio River Crossings," which are west of that line. Cairo, Ill., and Brookport, Ill., are the chief lower crossings, while Evansville and New Albany, Ind., and Cincinnati, O., are the upper crossings.

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[2] Not otherwise specified.

The distance from Chicago to the upper crossings is between 286 and 295 miles, and therefore, under the C. F. A. rate structure, the 300-mile rate applies, the rates to all the upper north bank crossings being "grouped," i.e., made the same. The rate from Milwaukee is made by adding an arbitrary differential to the Chicago rate, which differential is less than the local rate from Chicago to Milwaukee in order that competition for southern trade may be equalized.

The problem of dealing with the Lower Ohio River Crossings is somewhat different because they lie in Illinois, and traffic from Chicago moving south on combination rates via those crossings is therefore subject to a purely intrastate influence. The rate scale adopted by the state commission for intrastate shipments between Chicago and Cairo affects the through business. Accordingly, the lower crossings are not grouped, but each road applies the state mileage scale from Chicago to the crossing which it uses.

In all cases, however, the several roads "group" the various points in northern Illinois and southern Wisconsin which lie around Chicago, some including a larger number of points in the group than others. Between this Chicago group and points in the Southern Territory, the proportional rates in C

F. A. Territory are equalized, in order to enable a wide range of competition. For example, the rates from points on the south bank of the Ohio to Chattanooga, Tenn., have been the same, and, to equalize the northern points of origin, distance has been practically ignored by making the same proportional rate to the Ohio River Crossings whether the shipment originates at Chicago, Milwaukee, or Peoria. As a result, the through rates from the last-named points to the chief Southern points are identical. It costs no more to ship freight from Peoria, Ill., via the Brookport-Paducah crossing to Chattanooga than from Chicago via the New Albany-Louisville Crossing, except for the fact that there is a 2-cent ferry charge at the former and only a 1-cent bridge charge at the latter.

Effect of Intrastate Rates.—Another important factor affecting the C. F. A. rate structure, which has already been alluded to is the existence of different intrastate rate systems, although under recent rulings of the courts the Interstate Commerce Commission now has greater control over the situation than was the case prior to 1922. Illinois, fortunately, is the only state which has made much trouble. Formerly the Illinois rates were higher than those authorized by the Interstate Commerce Commission, which worked considerable hardship in the case of shipments moving across the state from Chicago to East St. Louis in competition with interstate traffic. A through shipment moving from Detroit via Chicago to St. Louis might move at the lower interstate rate, which could not be enjoyed by a Chicago competitor shipping under the Illinois scale.

That scale also affected rates from Illinois to outside points. A shipment from Peoria, Ill., to Crawfordsville, Ind., for example, would move under the interstate rates, while a shipment from the same point to Danville, Ill., which is near the

Indiana line, would move under the intrastate rate. The latter rate being the higher, it might be necessary to hold the rate to Crawfordsville high in order to "protect" the intrastate rate under the long-and-short haul clause.

But, following the interstate rate advances of 1920, the Illinois rates became lower than those fixed by the Interstate Commerce Commission, and accordingly we find such cases as the one in which complaint was made that rates on livestock shipments from central Illinois points to Indianapolis were much higher than those to Chicago, and the Interstate Commerce Commission ordered that the same scale should apply.

Naturally, the C. F. A. rate structure affects adjacent territory. An interesting case in point is that involving shipments from Wisconsin and Michigan points into northern Illinois. Recently, the Michigan paper manufactures in Kalamazoo and vicinity complained that their rates, being on the C. F. A. basis, were higher than those from the region of Fox River, Wis. Paper, which was rated 6th class in the Official Classification, was shipped at the rate of 12½ cents per hundred pounds for the 186 miles from Appleton, Wis., to Elgin, Ill., while for the 178-mile haul from Kalamazoo to Elgin the charge was only 17½ cents. The difference was even greater to those Lake points in northern Illinois and Wisconsin which are outside of C. F. A. Territory, for they lie in "prorating" territory to which the rates from the east are on an inflated mileage basis. The Interstate Commerce Commission ordered a readjustment, making the rates from Michigan to Elgin lower than from Appleton, Wis.

2. New England Rate Structure

New England Rate Structure Like that in C. F. A. Territory.—The rate structure of New England is taken up at this point because it is essentially similar to that existing in C. F. A. Territory. Indeed, the rate basis in New England is modeled after that which has just been described.

New England rates are to be found in the tariffs issued individually by the several carriers. In general, they are on a mileage basis and the Official Classification applies. Furthermore, the "Disque Scale" with its characteristic spread between classes is in effect.

For rate-making purposes, the New England Territory is divided into two zones—Zones A and B. Zone A covers the region of densest traffic, embracing Connecticut, Rhode Island, and most of Massachusetts. Zone B extends over the greater part of the states of Maine and Vermont, and throughout northern New Hampshire. The dividing line between the two zones runs from Rotterdam Junction, N. Y. (near Albany), through Ayer and Greenfield, Mass., and Bellows Falls, N. H., to Portland, Me.

The New England rate basis was provided by the Interstate Commerce Commission in a general New England rate case, decided in 1918. On the ground that Zone A is similar in its traffic and operating conditions to southern Michigan territory, the Commission prescribed that class rates in the New England Zone A should be equal to the Zone B rates of C. F. A. Territory, which it will be remembered, were arrived at by adding approximately 2 cents to the Zone A rate in that territory to get the Zone B 1st class rate, and then applying the percentages of the Disque Scale thereto, to arrive at the rates for the other classes.

In the New England Zone B, the Commission provided that the 1st class rate should be 10% above that in Zone A, and that the other classes should be determined according to the Disque Scale. Thus, a rate basis approximately 10% higher than that of the more intensively developed southern half of New England, is allowed for the northern portion where traffic is less dense.

The basis of rates on shipments between different zones, following the idea adopted in C. F. A. Territory, is made the same as that applying within Zone B; which is to say, that the highest scale of rates is applied on inter-zone shipments.

A Point of Difference.—One point of difference between the application of the New England basis and that of C. F. A. Territory lies in the fact that New England rates are quoted specifically from point to point, and there is none of the use of "basing points" that exists in the other territory. The reasons for this difference appear to be that there is less competition and there are so many fewer points in New England that specific quotations are practicable, as would not be true in the Middle West Territory.

Commodity Rates.—In New England there are many commodity rates on low-grade, heavy materials, these rates being generally quoted on a mileage basis. Some of the commodities enjoying such low rates are especially common in New England industries, such as logs and pulp wood. Among these commodities are also common brick, coal dust and coal screenings, ice, sand, and crushed stone (see Fig. 26, page 319).

Inter-territorial Rates.—In a broad way, the New England rate structure is based on the traffic problems of that territory. Those problems lie in getting raw materials, food, and fuel, into New England, and in moving manufactured products out. Accordingly, rates from the west—west of a Buffalo-Pittsburgh line—are blanketed to all New England points, thus enabling the widespread development of manufacturing throughout that territory. Rates on westbound traffic are the same as those from New York to all points beyond Cleveland, O., which enables New England manufacturers to compete for western trade.

3. Trunk Line Association Territory

No Uniform Rate Structure.—Within the Trunk Line Association Territory, which extends throughout the Middle Atlantic states, there is no such general system of rates as we have found to exist in Central Freight Association Territory and within New England, or such as applies on traffic between Chicago and New York. It appears that originally a distance basis was generally used in so far as the local rates of each line were concerned, and this naturally affected joint rates between many points. But competitive conditions have forced its abandonment in good part. Remains of local mileage rates may be found maintained by individual carriers in their local tariffs, and, as will be shown, the Chicago–New York rate structure exerts a large influence, which insures a partial observance of the distance principle on a percentage basis. There is, however, in this territory little uniformity, and the individual carriers do not use the same *scale* of rates between local points.

Influence of Competition.—A vital factor in the territory has been the competition of markets, together with the competition of other transportation agencies. Such towns as Buffalo and Erie, Rochester and Syracuse, New York, Philadelphia, and Baltimore, are rivals, and their competition has led to great modifications of mileage scales. Water competition is all-pervading, including not only competition on the Ocean and the Great Lakes, but also that on the Hudson, Delaware and Potomac rivers, the Delaware and Chesapeake bays and the Erie and other canals. Finally, in this section the competition of motor trucks for short-haul business has been considerable, especially since the rate advances of recent years.

The Trunk Line railways, in connection with a recent proposal to revise rates, have said:

> Many important factors in the freight rate structure in Trunk Line Territory are the result of the free play of carrier competition for the traffic of industrial communities which these railroads have built up during nearly a century. The rates thus evolved reflect the effort of the carriers to keep competing communities and industries in a transportation relationship, and the element of distance in many important adjustments has not been regarded as controlling, although distance is an important factor in the cost of transportation.

Prevalence of Group Basis.—As a result of these conditions, rates, except on short-haul local traffic, are largely made on the "group" basis. That is, the territory is divided into numerous rate groups, each embracing considerable sub-territories, and rates to and from all points in a group are the same regardless of differences in distance. This plan equalizes neighboring competitive points, and at the same time facilitates the quotation of rates by the carriers. To mention but a few groups, the New York group includes not only New York City proper but points in northern New Jersey and for some traffic extends up the Hudson River nearly to Albany. The Syracuse group includes several important manufacturing points in Central New York. Other groups center in Philadelphia, Baltimore, Williamsport, Scranton, Pittsburgh, Buffalo, Albany, the "Virginia Cities," and a number of other cities. The points embraced in a group differ somewhat according to the outside point from or to which the traffic moves. Thus for traffic to or from Johnstown, Pa., the New York group extends well up to Albany, while for traffic to or from Philadelphia, it is much more restricted.

In some cases, rates are made by adding uniform arbitraries to the rate to or from a base point, as, for example, rates between Trunk Line Territory and Southern New Jersey points are made by adding arbitraries of 5 to 7 cents either to the New York or to the Philadelphia rate, the base depending on the location of the natural gateway for the traffic. Pittsburgh, because of its importance as a traffic center, is a great basing point, and rates to eastern points from such centers as the Mahoning and Shenango valleys and Johnstown, Pa., are made by adding to or deducting from the Pittsburgh rate certain fixed amounts. These amounts have been arrived at through a long period of competitive adjustments and do not represent any uniform mileage scale.

Another prevalent condition resulting from competition is that rates between competitive points are generally equalized (without regard to distance). The rates from Buffalo, for example, to New York, Philadelphia, and Baltimore rate-points are on a parity, and the same may be said of rates from Rochester.

The effect of the Chicago–New York scale on rates between the seaboard and interior rate points is widespread.

The "Western Termini."—Certain cities at the western edge of Trunk Line Association Territory are known as the "Western Termini." These border points, which include Pittsburgh, Erie, Buffalo, and Wheeling, are treated in some respects as if they were in a percentage zone of Central Freight Association Territory, and rates between "Pittsburgh-Erie points" and New York are determined on the basis of 60% of the Chicago–New York rate. Thus, if the latter rate is $1.42 per hundred pounds, the 1st class rate from New York to Pittsburgh or to Erie is 60% of that figure or $.85. From Philadelphia and Baltimore, in turn, the rate to Pittsburgh-Erie points is made by deducting certain differentials from the New York rate to these points.[3]

Rates to eastern interior points which are intermediate between the western terminals and the ports are often made in a similar way. From Buffalo to New York, for instance, the rate is found as follows: The rate from Erie, Pa., which is a 60% point in the Chicago–New York percentage scheme, is taken as the immediate basis, and from it is deducted the Philadelphia differential applying on domestic traffic (6 cents on 1st class traffic). The low rate thus obtained applies from Buffalo to all the ports. This low rate will be found to be equal to the rate from Erie to Philadelphia. It is considerably lower than the rate from Erie to New York, a fact which is due to the water competition offered by the Erie Canal–Hudson River route. In other cases, however, the rates to or from the interior eastern points are made without relation to the percentage system, sometimes by adding an arbitrary to the rate at a basing point, and sometimes by a special independent adjustment.

Space forbids a discussion of the rates applying from points in this territory to the "Virginia Cities," but it may be noted that, except from coast points where ocean competition is effective, such rates as well as those to Washington are made with reference to Baltimore. Buffalo, and interior New York points take a rate made by adding an arbitrary over their rates to Baltimore (or Wilmington, Del.).[4] Pittsburgh and Buffalo have rates to the Virginia Cities the same as the rate from Columbus, O., to Baltimore.

A great many instances might be given of the way in which the Chicago–New York percentage system affects rates within Trunk Line Association Territory, and how that effect is modified by competition. Suffice it to say that in general the rates between Pittsburgh-Erie rate-points and the interior points of this territory (such as Utica, Syracuse, and Rochester) are made with relation to the rates to and from New York.

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[3] See page 365.

[4] Rates to and from Norfolk, Va., and points on the Delaware peninsula are arbitraries over Wilmington, while rates to and from Richmond, Va., and Washington, D. C., are arbitraries over Baltimore.

Between other points within the Trunk Line Association Territory, rates are made with chief regard to competitive conditions. In such cases "local" points are generally "grouped" with that one of the two nearest junction points ("common points") on the line which lies furthest from the destination point.

A Local Trunk Line Rate Scale.—An interesting illustration of a local rate structure within Trunk Line Association Territory may be found by analyzing the local class tariffs of the New York Central between New York City and Buffalo. Such an analysis shows rather clear evidence of the remains of 10-mile rate blocks between New York and Albany, although the distance between points at which rates increase varies from 4 to 24 miles. Between Albany and Buffalo the length of the rate blocks is clearly increased, ranging from 13 miles to 34 miles. Thus, there is no change in the rate from New York City between Rome and East Syracuse, which is a distance of 34 miles. It will be remembered that in the C.F.A. scale the mileage blocks get longer as the distance increases, and consequently, some evidence of the same principle appears in the local class rates in force on the New York Central.

Another point which emerges is that the amount of the increase in rates shows a tendency to be alternately larger and smaller. Thus, the 1st class rate increases at Chelsea from 29 to 30 cents, a 1-cent increase; at Poughkeepsie it jumps to 32 cents; at Hyde Park to 33 cents, and so on, with alternating increases of from 1 to 2 cents. This again reminds one of the C.F.A. scale.

The rate per hundred pounds per mile decreases rather steadily throughout the entire distance from New York to Buffalo, beginning at 1.7 cents and ending at .13 of a cent.

The 5th class rate does not run parallel with the 1st class rate in several respects. It does not break at the same points; there is a smaller number of distance blocks, and the increases are a greater per cent of the rate itself.

The effects of competition are strongly stamped upon this rate scale, especially in the grouping of rates over long stretches in central New York within which lie important competitive points. This is well illustrated by the fact that all points within the 61-odd miles between East Syracuse and Brockport, including Rochester and Syracuse, take the same rate from New York City. Some evidence may be found, too, of the way in which junction points with other railways tend to determine where rate increases shall take place.

Proposed Revision.—Recently, the Trunk Line railways have proposed a revision of rates in this territory which would be based on a mileage scale similar to that in Central Freight Association Territory. This would necessarily destroy many of the present rate adjustments, since the existing rate "groups," as already explained, necessarily ignore distance to a large extent. As the carriers state in their announcement: "It may prove impossible to bring rates created under the mileage principle into a consistent relationship with those established under the group principle. In the end it may be found necessary to accept the practical advantages of rate schemes based upon both the mileage and group principles as justifying the continuance of such inconsistencies as can only be avoided when these principles clash, by rate changes of great magnitude."

CHAPTER XXII

THE CHICAGO–NEW YORK RATE STRUCTURE.—PORT DIFFERENTIALS

An Inter-Territorial Rate Structure.—In describing the preceding rate structures we have been dealing essentially with intra-territorial traffic. The C.F.A. Territory scheme applies directly only to shipment moving within Central Freight Association Territory. The rate scheme now to be described, however, involves only inter-territorial rate bases, and applies on shipments made between points in C.F.A. Territory on the one hand and points in the New England and in the Trunk Line Association territories on the other—Chicago lying on the western edge of C.F.A. Territory and New York at the extreme eastern boundary of Trunk Line Territory.

Many Routes between Chicago and New York—Standard and Differential.—In taking up the Chicago–New York rate structure, it will be well to note that between the two points indicated there are many different transportation routes, and further, that these routes tend to fall into two groups known as "standard" and "differential" routes. Standard all-rail rates are made by roads having direct routes, such as the New York Central, Pennsylvania, Baltimore and Ohio, and Erie. The differential routes are circuitous, or offer inferior service, and their rates are made by deducting certain amounts from the standard rates. They include the Grand Trunk and the rail-water routes. The rail-lake routes lie over the Lehigh Valley, the Lackawanna, the Erie, or the New York Central, to Buffalo or some other eastern lake port, and thence west by lake boat. The ocean-and-rail routes are those via the Virginia ports or Baltimore, and the Chesapeake and Ohio, or Baltimore and Ohio railways. Then there is the Long Island Sound and Canadian route, which is very circuitous and little used, its course lying up the Sound to New London, Conn., and thence by the Central Vermont and Grand Trunk railways to Chicago. Finally, there is an all-water system via the Erie Canal and the Lakes. As between the rail-and-lake and the ocean-rail routes, there is little to choose, as both involve a transshipment. The Long Island Sound route not only requires a transshipment, but is much longer and to gain any freight at all the rates must be lower than by the other routes. The Erie Canal and Lake route, involving as it does several transshipments, the lapse of much time, and the bearing of heavy risks and marine insurance, can only be used for low-grade traffic, moving at the lowest possible rates.

Needless to say, the existence of these alternative routes has made keen competition in the past and today prevents exorbitant charges between New York and the Middle West. It will be interesting to see what sort of a rate structure has been built up in so competitive a territory.

Origin of Chicago–New York Rate Structure—Competitive Conditions.—Before describing the New York–Chicago rates, it is important to glance at the origin of the system. In fact, this system dates back to the fierce rate wars of the early 70's, arising out of the rivalry of the ports of New York, Philadelphia, and Baltimore for export grain traffic and made worse by chaotic domestic rates both east and west. The port rivalry for eastbound traffic will be discussed in another connection.[1] Here we shall note that among several disturbing factors one of the most important was the power exercised by numerous north and south railways, lying in Ohio, Indiana, and Illinois, which cut across the various Trunk Line routes. For example, freight from Columbus, O., could move east by such railways either via Pittsburgh, or Wheeling, or Parkersburg, or Cleveland and Buffalo. Each of these potential routes could be played against the others. Any transverse line, crossing more than one of the Trunk Lines, could divert its traffic to either of its connections. This kept the rates both eastbound and westbound in a disturbed condition, and led to excessive competition.

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[1] See page 416*f*.

More than this, water competition furnished a serious problem, for on the north, traffic could move from Chicago to Buffalo by lake and thence either by canal or rail to any one of the North Atlantic ports. On the south, the Ohio River carried more or less traffic from Pittsburgh.

To add to these disturbing factors, rebates and secret rates were common. No one knew what special advantages his competitor enjoyed, and the situation was impossible.

The First Attempt to Remedy—MacGraham Scale.—It came to be realized that two remedies were required: first a fixed system of differentials as between Boston, New York, Philadelphia, and Baltimore, which would fairly equalize those ports with reference to the export grain traffic; second, a uniform rate structure which could be observed by all, thus controlling the north and south lines and water competition, and preventing cutthroat competition.

Accordingly, back in 1876, the precursor of the present system, called the MacGraham Scale, was adopted. The rate between Chicago and New York was taken as a basis and called 100%. Then certain other points were given percentages of the Chicago–New York rate based on the ratio of their distances from New York to the total distance between Chicago and New York. In determining distances the shortest worked and workable route was taken as the basis. These percentage points were "basing points." Rates to New York from stations intermediate to these basing points were made by adding to the basing point rate the local rate between the intermediate point and the basing point.

An important improvement was promptly adopted by the railways. It was soon realized that only a part of the operating expenses vary with the distance and, accordingly, that to have the rates vary exactly with the distance was not logical. The expenses which do not vary with distance are notably the terminal expenses involved in loading and unloading goods at the points of origin and destination. It was therefore arranged that before applying the distance percentages to the base rate, an allowance for terminal expenses should be deducted and be added back to determine the final rate. For example, if the Chicago–New York rate were $1.00 and the sum of the terminal charges at both ends of the line were 6 cents, the line haul charges would be approximately 94 cents. If, therefore, it is desired to determine the percentage rate for a 60% point, 60% of 94 cents is taken, or 56.4 cents. To this is added the 6 cents, making the rate equal 62.4 cents, instead of the 60-cent rate that would have resulted from applying the 60% directly to the $1.00 base rate.

Of course, this virtually destroys the original direct 60% relationship, as 62.4 cents is approximately 63% of $1.00. It appears to have been on the basis of this revised way of figuring the rates that the present percentage zones were established, although at present the percentages are again applied directly to the total rate.

Shortcomings of the MacGraham Scale.—The MacGraham Scale helped somewhat, but it failed in two important respects. In the first place, it did not comply with the distance principle of rate making sufficiently, and consequently violated the long-and-short haul clause of the Interstate Commerce Act (which then required that railways should not charge more for a shorter than for a longer haul over the same line and under similar conditions). The rate from "intermediate points" to New York, for example, would be determined by adding (1) the local rate from that point back west to the nearest basing point which was farthest away from New York, to (2) the percentage rate from that basing point to New York. Consequently, the rate from the intermediate point would be greater than that charged for the longer haul from the basing point.

In the second place, this scheme did not provide sufficiently for the disturbing power possessed by the transverse north and south lines. There was no arrangement required that each of these lines should lie entirely within the same rate zone, and accordingly, some of them cut across several of the Trunk Lines at points which had different percentage rates, with the result that equality in competition and the integrity of the rate zones could not be maintained. Obviously, if Terre Haute, Ind., and Joliet, Ill., are both on the same north and south line, but lie on different east and west Trunk Lines and have different rates to New York, the north and south line which serves both points is going to divert traffic from the more remote point (Joliet) through Terre Haute to the southern Trunk Line, and the northern Trunk Line is going to cut its rate from Joliet. (This is on the assumption that the traffic originating or received at these points is of importance.)

The Present Chicago–New York Rate Structure.—The present Chicago–New York rate structure came about as a revision of the MacGraham Scale. Between 1887, when the Interstate Commerce Act was passed, and 1896, the percentage system was changed and improved. In the first place, the long-and-short haul clause was applied by zones. These zones (Fig. 29) are irregularly shaped strips of territory, extending in a general north and south direction, with a single rate applying between all points in each zone and New York. For example, one zone extends from Evansville, Ind., and Louisville, Ky., up along the Illinois-Indiana line, through Chicago, and from every point in this zone the rate to New York is the same. Another zone extends through the territory occupied by Columbus, Toledo, and Detroit, and from all points in this zone the rate to New York is 78% of that applying from the Chicago zone. Accordingly, there is no need for basing and intermediate points, as was the case under the MacGraham Scale, but towns are grouped together according to competitive conditions and the quoting of rates is greatly simplified.

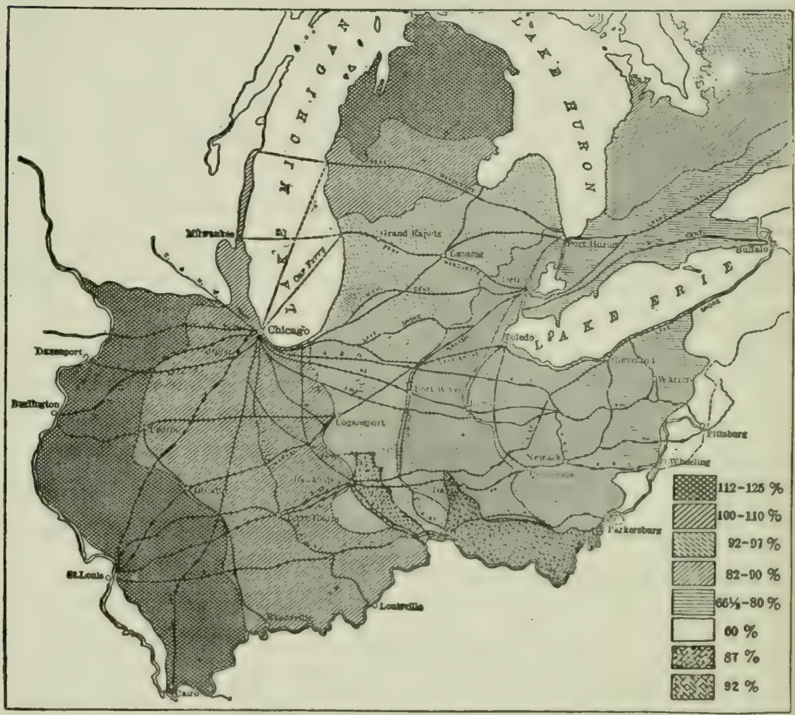

Fig. 29.—Freight Rate Zones of the Chicago–New York Percentage Structure

In the second place, the percentage rate zones are so shaped as to minimize the trouble arising from the transverse north and south lines and from water competition. Thus, the western boundary of the 100% zone, in which Chicago lies, follows the line of the Chicago and Eastern Illinois railway, and similarly the western boundary of the 76-80% zone follows the lines of the Cincinnati, Hamilton and Dayton, and Toledo and Ohio Central, which makes it include Toledo, Lima, and Columbus, O. As a result the rates east or west from all points on the north and south line are the same, thus removing direct incentive to favor one Trunk Line over another and enabling the transverse roads to work their lines both ways. It appears to be with some reference to water competition, too, that the 100% zone extends up the eastern shore of Lake Michigan; for this extension of a rate to points along the lake whose distance from New York would seem to require a higher rate, indicates a desire on the part of the railways to secure a larger part of the traffic.

Competitive Conditions Affect Zones.—In devising the present percentage rate zones, competitive conditions as affecting different markets have been given considerable recognition. A study of the map in Fig. 29 will show that along the Ohio River, between Cincinnati and Parkersburg, W. Va., there is a stretch of territory which is not very intensively developed in an industrial way. Accordingly, the 87% rate zone (that is, the zone in which rates to New York are 87% of those from Chicago to New York) extends almost due east and west in this sparsely developed territory. This means that the rates from a point many miles west of Parkersburg are the same as those from points in the immediate vicinity of Parkersburg, a situation which could only exist where traffic is small and there is little railway competition. On the other hand, the shape of the 93% rate zone illustrates the working of opposite conditions. This is a narrow zone which has its southern point near Cincinnati, but its western boundary is stretched to the west to include the city of Indianapolis within the zone, thus giving that point as low a rate as is enjoyed by Cincinnati.

Another illustration of these same forces is furnished by the history of the percentage rate enjoyed by Detroit. Originally, that city was in the 85% rate zone, but as a result of competition an extension of the 78% zone, in which lie Toledo and Columbus, was made northward to include Detroit territory, thus favoring this territory with a reduction in rates.

Illustrative Rate Percentages.—Merely to give the reader a general idea of the percentages, the following list, showing some of the chief percentage rate groups in C. F. A. Territory, is presented. It is to be remembered that these groups have their significance only with regard to inter-territorial traffic between C. F. A. Territory and eastern points outside that territory.

	Westbound Percentages of Chicago–New York Rate	Eastbound Percentages of Chicago–New York Rate
St. Louis, Mo.	117%	117%
Peoria, Ill.	110	110
Chicago, Ill.	100	100
Milwaukee, Wis.	100	100
Louisville, Ky.	100	100
Indianapolis, Ind.	93	93
Kalamazoo, Mich.	92	92
Cincinnati, O.	87	87
Detroit, Mich.	78	78
Toledo, O.	78	78
Columbus, O.	78	77
Cleveland, O.	71	71
Youngstown, O.	67	66½
Pittsburgh, Pa.	60	60

It will be noted that the percentages are practically the same both eastbound from C. F. A. Territory to New York, and westbound from New York to points in C. F. A. Territory.

Port Differentials.—An important phase of the rate structure between the Middle West and the Atlantic seaboard is the existence of differential rates to the several North Atlantic ports. As the result of a long competitive struggle among the ports of Boston, New York, Philadelphia, and Baltimore, an arrangement has been built up under which the Chicago–New York rate has become the basis of a series of differentials, the rates from Chicago to the other ports being determined by adding to or deducting from the Chicago–New York rate certain fixed amounts called "differentials." These differentials vary according to the direction of the traffic, and also there is a difference in the amount of the differential applying to the different classes of freight. The simplest way to make the situation clear is to present the facts in the form of a table, such as that which follows, remembering that the Chicago–New York rates shown have been subject to frequent change of late. This table applies only to domestic traffic.

Classes	1	2	3	4	5	6
Chicago–New York rates per 100 lbs.	$1.42	$1.24½	$ .94½	$ .66	$ .56½	$ .47½
[1] Chicago to Boston arbitraries *over* Chicago–New York rate (from 66½% rate zone and beyond)	.07	.06	.05	.04	.03	.02
[1] Boston to Chicago (to 66½% rate zone and beyond); arbitraries *over* Chicago–New York rate	0	0	0	0	0	0
Chicago to Philadelphia; differentials *under* Chicago–New York rate	.02	.02	.02	.02	.02	.02
Philadelphia to Chicago; differentials *under* Chicago–New York rate	.06	.06	.02	.02	.02	.02
Chicago to Baltimore; differentials *under* Chicago–New York rate	.03	.03	.03	.03	.03	.03
Baltimore to Chicago; differentials *under* Chicago–New York rate	.08	.08	.03	.03	.03	.03

In order to determine the rate on domestic traffic from Chicago to Baltimore, therefore, it is only necessary to subtract 3 cents from the rate from Chicago to New York, whatever the class of freight may be, and the same differential is deducted on shipments to Baltimore from any of the percentage rate zones. It will be observed, that in the case of Boston, the arbitraries on domestic traffic to be added to the Chicago–New York rate are different for each class, and that the westbound differentials enjoyed by Philadelphia and Baltimore are larger for the first and second classes than for the others.

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[1] From and to the 60% zone, the differentials on the several classes are 5, 4, 3, 3, 2½, 2 cents respectively.

Rates between C. F. A. Territory and Eastern Interior Points.—Not only are these seaboard differentials based on the percentage zones of the Chicago–New York rate structure, but that structure also is the basis for rates between C. F. A. Territory and interior points in Trunk Line Association Territory, such as Albany and Syracuse, N. Y., and Scranton, Pa.; and it should be noted here that Trunk Line Association Territory is divided into numerous rate groups, of which the points just mentioned along with others are the centers. Thus, around Albany there is a group of towns, all of which take the Albany rate and which together constitute the "Albany Rate Group." A few typical cases will serve to illustrate the situation.

To Albany, N. Y., and other points in the Albany Rate Group, the class rates from the several percentage rate groups of C. F. A. Territory are 96% of the rates from those points to New York. To illustrate, if the rate from Chicago to New York is $1.42, then the rate from Columbus, O., which is in the 78% zone, is $1.11 to New York, while the rate from Columbus to Albany is 96% of $1.11, or $1.065. Westbound from Albany rate points to points in C. F. A. Territory, the adjustment is somewhat different, the rate being the same as that from New York City, minus 20% of the New York–Chicago rate. There are certain details not here stated such as the naming of a minimum rate, but this serves to illustrate the way in which class rates between C. F. A. Territory and eastern interior points are based.

Two other cases may be mentioned merely to illustrate variations in the general scheme: (1) To the Scranton, Pa., rate group, rates from all C. F. A. points eastbound are made the same as the rates to Philadelphia—which, it will be remembered, are certain differentials under New York. Westbound from Scranton points to 70% points in C. F. A. Territory, the rates are made by adding differentials varying from 1 to 2 cents per hundred pounds over the rate from Williamsport or Syracuse, while to all other C. F. A. points the rate is 80% of the New York rate. (2) The "Virginia Cities" (Richmond, Roanoke, etc.), which are the gateways to the South, are served by lines which are in competition with other lines which enter the South via the Ohio River Crossings. These rates ultimately depend on the New York rate but are based directly on Baltimore.

Commodity Rates.—Commodity rates between the Chicago and New York territories are generally made with some relation to the percentage system which has been described, especially where such rates are made under "general authorization," i. e., applying to all points within the territories. Westbound, however, the percentage system does not appear to be so rigidly followed in making commodity rates as it is eastbound. Certain minimum rates are named and it is therefore necessary to consult the tariffs in each case. For example, if the New York–Chicago commodity rate is 31 cents per hundred pounds, a minimum rate to Pittsburgh and other 60% points may be fixed at 25 cents, and as this minimum rate is 80% of the 31 cents, it is apparent that when it applies the 60% relationship is destroyed.

Summary.—In this chapter, then, we have taken up one of the most interesting and important rate structures in the United States—one which concerns the most important railways and which governs the rates applying to the densest traffic. This rate structure is based strictly upon the long-and-short haul principle, namely, that higher rates shall not be charged for shorter than for longer distances. To this extent, it is a distance scheme; but as points of origin and destination are grouped, the distance principle is not strictly applied. The application of the long-and-short haul principle is secured by means of a system of percentage rate zones, the rates from and to all points in which are based on a percentage of the Chicago–New York rate, the percentage being determined by relative distances. The Chicago–New York rate, itself, is the result of a long competition among the various Trunk Lines and between the all-rail routes and the rail-lake routes. Upon this percentage zone rate structure largely rest the numerous rate adjustments between middle-western points and both the North Atlantic ports and eastern interior points.

CHAPTER XXIII

THE SOUTHERN RATE STRUCTURE*

Importance of Studying Southern Rate Situation.—It is probable that the rate structure of the South has been more confused and complicated than that of any other large territory. At present that structure is being reconstructed and being worked out on modern principles of rate regulation. This section therefore affords a laboratory for studying tariff building, and the more elaborate discussion here presented will be of especial interest to those who desire a more detailed and thorough knowledge of the subject.

Southern Rate Territories.—The territory to be discussed embraces the region south of the Ohio and Potomac rivers and east of the Mississippi River, and includes all the area governed by the Southern Classification. All rate changes in this territory are subject to the authority of the Southern Freight Association, with headquarters in Atlanta, Ga. For the purposes of rate making, the territory is now usually considered as falling into three groups, which are as follows:[1]

1. Carolina Territory
2. Southeastern Territory
3. Mississippi Valley Territory

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* The author desires to acknowledge the assistance given by the late Mr. D. M. Goodwyn, Freight Traffic Manager of the Louisville and Nashville, and Mr. R. E. Hodgkin, Assistant to the General Freight Agent of the Atlantic Coast Line, in the preparation of this chapter.

[1] See Figs. 27 and 30.

Carolina Territory embraces southern Virginia (that part of Virginia lying south of the Norfolk and Western Railway from Bristol through Roanoke and Lynchburg to Norfolk), and the states of North and South Carolina.

Southeastern Territory includes the area east of a line from Paducah, Ky., through Jackson, Tenn., and Columbus, Miss., to Mobile, Ala., and west of the North Carolina and South Carolina state lines. In a general way, this territory includes most of the states of Tennessee, Alabama, Georgia, and Florida, and a small strip of eastern Mississippi.

Mississippi Valley Territory includes practically all of Mississippi and a small portion of Western Tennessee, Western Kentucky, and Eastern Louisiana (east of the Mississippi River).

Conditions Underlying the Southern Rate Structure.— Three controlling factors have been responsible for the development of the Southern rate structure: (1) water competition, (2) the competition of northern manufacturing centers for the southern market, and (3) the rivalry among southern ports and jobbing centers.

1. *Water Competition and the Basing Point System.*— The Southern Freight Association Territory is practically surrounded by navigable waters, with the Atlantic Ocean and Gulf of Mexico on the east and south, and the Ohio and Mississippi rivers on the north and west. Numerous streams flowing to the Atlantic and the Gulf, or tributary to the Mississippi, are more or less navigable, in some instances for several hundred miles inland. Thus, rail transportation is affected by water competition not only at the ports but at many interior cities, including Nashville and Chattanooga, Tenn., Montgomery and Selma, Ala., and Macon and Augusta, Ga.

The rail rates to the ports and to interior Southern cities at the head of inland navigation were formerly made with reference to the charges for water transportation, while the rates to local railway stations intermediate to or beyond such points, where there was no water competition, were made by adding together the rate to the point having water competition and the local rates beyond. This situation gave rise to the "basing point" system of rate making which was formerly in universal use in the South. As a result of competition among communities and among the railways serving them, not only points at which active water competition existed but practically all interior cities of any considerable size or importance, if reached by two or more carriers, became basing points, and enjoyed the benefit of depressed rates. Rates to less fortunate communities of smaller size, however, were made by taking a combination of the rate to some basing point and the local rate from the basing point to the town in question. This was true even when the destination lay between the basing point and the point of origin. Accordingly, practically every rate of the Southern lines, up to a few years ago, constituted a violation of the long-and-short haul clause of the Interstate Commerce Law, and the distance theory of rate making was given very little consideration.

As an example, the rates from New York or from St. Louis to Millen and Tennille, Ga., stations on the Central of Georgia Railway near the coast, were made on combination of rates to Savannah, Augusta, or Macon, Ga., and the local rates beyond, the lowest total so made being adopted as the through rate.

Illustrations of departures from the long-and-short haul clause could be found in any territory, but in the South the situation was more nearly the rule than the exception. This situation resulted in severe discrimination against intermediate points, which were charged a higher rate for a shorter haul, and it brought about endless complaint and litigation.

As a result of various decisions of the Interstate Commerce Commission, supplemented by voluntary revisions made by the carriers, the rates from the East and West to the Southeast have been brought into conformity with the long-and-short haul clause, except at destinations where the Commission granted relief in 1914 on account of water competition.[2] The rates from all points to the Mississippi Valley and Gulf ports and from the East to Carolina Territory, as well as the interstate rates between Mississippi Valley points and between Carolina Territory points, have been revised in strict compliance with the fourth section of the Interstate Commerce Act, i.e., the long-and-short haul clause.

The old basing point system, however, still generally governs the rates between points in Southeastern Territory, and the commercial and industrial development of the section has been permanently affected by it. Furthermore, water competition will always have a strong influence on rates in the South.

2. *Competition Among Northern Shipping Centers.*—New York, Philadelphia, and Boston have sought to maintain their original predominance as the source of supply for clothing, boots and shoes, and other manufactured articles, while Chicago, St. Louis, and other middlewestern points have made constantly increasing progress in competing for the trade. The carriers serving these competing manufacturing centers have tried to maintain rates which would permit them to control the Southern trade.

3. *Competition Among Jobbing Centers.*—Furthermore, carriers serving the various Southern jobbing points have endeavored so to adjust both the inbound and outbound rates of such points as to enable them to distribute merchandise within the greatest possible radius. In Tennessee, Nashville, Chattanooga, and Knoxville have been rival jobbing centers; in

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[2] *Long-and-Short Haul Violations in the Southeast,* 30 I. C. C. 156.

Alabama, Birmingham, Montgomery, and Selma have sought the ascendancy; in Mississippi, Jackson and Meridian compete for the local trade; and many other illustrations might be given. This competition of markets, coupled with competition of the railways serving them, by adjustment and compromise has brought about a system of differentials among origins and destinations which is fundamental in the Southern rate structure.

Importance of Atlanta.—It will help towards an understanding of Southern rates to note the pivotal importance of Atlanta.[3] Atlanta is the center of the Southeastern cotton section, and thus naturally occupies a very important place in the traffic of Southern railways. More important, however, from a railway point of view, is the fact that Atlanta lies at the southern end of the Allegheny mountains, and is thus a natural gateway between the Atlantic seaboard and the southern Mississippi Valley. Lying at a point where the railways can most easily connect the Atlantic ports with the Mississippi Valley, it has somewhat the importance of Buffalo and Pittsburgh. At Atlanta we naturally find a great junction point between the railways which run along the southern seaboard from the northeast and those which extend from the South Atlantic ports to the West. Moreover, it is in Atlanta that the railways which extend from the Central West meet the railways from the Northeast. Atlanta is the apex of a great triangle, with New York and Chicago at the other angles.

Finally, from a widely scattered number of important seaports numerous railways are focussed on Atlanta, and a glance at a map will show that a fan-shaped group converges from Wilmington, Charleston, Savannah, Jacksonville, Pensacola, and Mobile. There are several important "railway centers" in the South, notably Memphis and Louisville, but in the Southern rate structure Atlanta stands out as being truly pivotal.

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[3] See Fig. 15.

The Existing Rate Structure in the South—Atlanta and Montgomery Sub-territories.—"Southeastern Territory" is

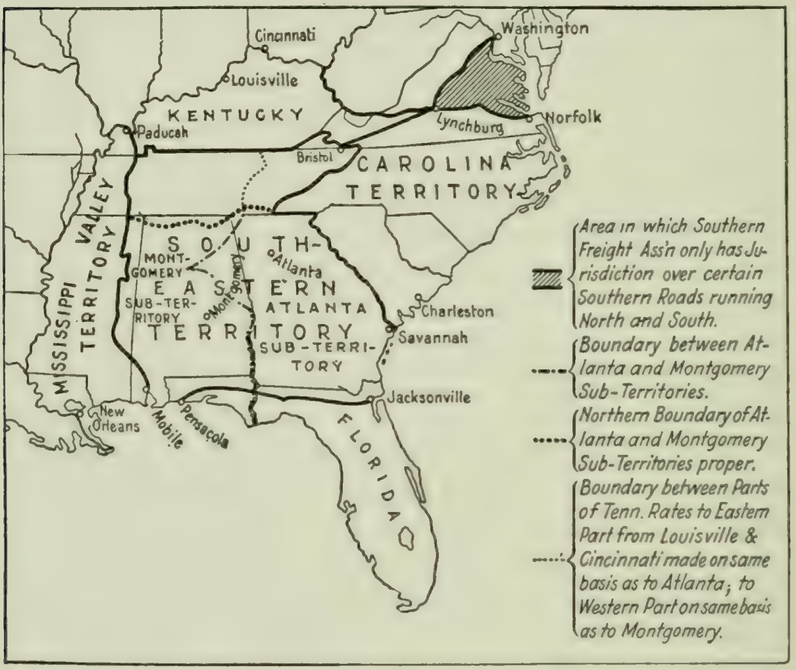
Cincinnati
Washington
Louisville
KENTUCKY
Paducah
Lynchburg
Norfolk
Bristol
CAROLINA TERRITORY
SOUTHEASTERN TERRITORY
MONTGOMERY SUB-TERRITORY
Atlanta
Montgomery
ATLANTA SUB-TERRITORY
MISSISSIPPI VALLEY TERRITORY
Charleston
Savannah
Jacksonville
New Orleans
Mobile
Pensacola
FLORIDA
▨ Area in which Southern Freight Ass'n only has Jurisdiction over certain Southern Roads running North and South.
-·-·- Boundary between Atlanta and Montgomery Sub-Territories.
······ Northern Boundary of Atlanta and Montgomery Sub-Territories proper.
·····: Boundary between Parts of Tenn. Rates to Eastern Part from Louisville & Cincinnati made on same basis as to Atlanta; to Western Part on same basis as to Montgomery.

Fig. 30.—Rate Adjustment Territories within Southern Freight Association Territory

divided into two parts: (1) Atlanta Sub-territory, and (2) Montgomery Sub-territory. To Atlanta the distances from all of the Ohio River Crossings are nearly equal and the same is true at Chattanooga; consequently the same rates are applied from all of the crossings to these and other points in "Atlanta Sub-territory," which is, roughly speaking, the area to which the short-line distances from the Ohio River Crossings are through Chattanooga and Atlanta.

To Montgomery, Birmingham, and other points in "Montgomery Sub-territory," the distances from the Ohio River Crossings at Louisville and points west thereof are substantially less than from Cincinnati, and the 1st class rates are made 15 cents less than from Cincinnati. From Cincinnati, however, rates to Atlanta and Birmingham are the same. Rates from the West to points south of Atlanta and Birmingham are built up in zones by adding differentials over these points, except that certain water competitive points enjoy depressed rates. The rates from St. Louis are made differentials higher than from Evansville and Cairo.

Water and rail rates from Baltimore to Atlanta were formerly made the same as from Louisville, Ky. This relation has been lost,[4] but the Baltimore-Atlanta rail-water rate is an important basis in making rates from Eastern points to the South.

Large Areas "Blanketed."—In order to avoid departures from the long-and-short haul principle, via the various all-rail and water-and-rail routes through the Virginia Cities and the South Atlantic ports, the rates from the East have been "blanketed" (made the same) to large destination areas. Thus the rates to Atlanta apply to practically the entire state of Georgia and a considerable part of eastern Tennessee. Further west, a large part of Alabama is blanketed at the Montgomery-Birmingham rates. From New York and Philadelphia the 1st class rate is generally 12 cents higher than from Baltimore, and the rate from Boston is 8 cents over New York. These differentials are more or less arbitrary, but the relationship has stood the test of time and will probably continue substantially as at present.[5]

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[4] As a result of a reduction in the water and rail differential under all-rail rates and also the 33 1/3% advance in inter-territorial rate as compared with the 25% advance from Louisville to the South, under I. C. C. Order Ex Parte 74.

All-Rail vs. Rail-Water Rates.—All-rail rates from the eastern ports to all southeastern points on and east of a line from Chattanooga, through Birmingham, Montgomery, and Selma, are 10 cents higher, 1st class, than via water and rail. Clearly the rail-and-water routes through the south Atlantic ports affect the rates to the greater part of the southeast, as these routes maintain a differential under all-rail rates more than 400 miles inland. A slightly smaller differential under all-rail rates is maintained by rail-water-and-rail routes from Interior Eastern Trunk Line points east of the Buffalo-Pittsburgh zone. Thus even the rate from Rochester, N. Y., to Birmingham, Ala., through New York and Savannah, is made a differential under the all-rail rate. To points west of Chattanooga, Birmingham, and Selma, however, including Mississippi Valley Territory, the water-and-rail rates via the Virginia and South Atlantic ports are the same as the all-rail rates. Differential (lower) rates also apply via the Gulf Ports of Mobile and New Orleans as far north as Montgomery and Selma, Ala., and Meridian, Miss.

Mississippi Valley Rates.—In the past, water competition on the Mississippi River has resulted in abnormally low rates to the lower Mississippi River points, Memphis, Helena,

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[5] The rail-water rate between Baltimore and Atlanta, 1st class, was in 1922 \$1.88½ per hundred pounds, and the rates from New York, Philadelphia, and Boston are constructed by adding differentials to this figure. The all-rail rates are made up by adding 10 cents to the rail-water rate. This scale is illustrated in the following table:

Rates to Atlanta from	Rail-Water Rate	All-Rail Rate
Baltimore	\$1.88½	\$1.98½
Philadelphia New York	2.00	2.10
Boston	2.08½	2.18½

Thus it appears that in 1922 the 1st class rates from New York and Philadelphia were 11½ cents above those from Baltimore, while the rates from Boston to Atlanta were 20 cents over the Baltimore rate.

(Ark.), Greenville, Vicksburg, Natchez, Baton Rouge, and New Orleans. The rates to the interior Mississippi Valley points were much higher and generally made on the basing-point system, i. e., on a combination of rates to and beyond these river points. The influence of river competition has affected the rates from Chicago and the Middle West, from the Buffalo-Pittsburgh Zone, and from the eastern ports, all of which were very much lower to lower Mississippi River towns than to other southern points.

This situation naturally resulted in many long-and-short haul violations. The Interstate Commerce Commission finally decided that such water competition as existed on the Mississippi River did not warrant such violations, and accordingly they have been removed and the rates have been put on a so-called "dry-land" basis, giving more regard to distance as a guiding principle. The class rates from St. Louis to Memphis are now made a certain differential higher than from Cairo. Louisville is given the same rates to Mississippi Valley points as St. Louis, and Cincinnati is given a rate 15 cents (the same as the Montgomery Sub-territory differential) over Louisville, while Chicago is made a differential over St. Louis.

Mississippi Valley Territory falls into six destination groups on business from St. Louis and related points, namely:

1. Memphis-Corinth Group
2. Helena-Tupelo Group
3. Greenville-Greenwood-Columbus Group
4. Vicksburg-Jackson-Meridian Group
5. Natchez Group
6. New Orleans-Mobile-Pensacola Group

The rates from St. Louis and Louisville to Memphis having been fixed, the other destination groups are determined by adding differentials to the Memphis rate.

Competing with St. Louis, Louisville, Chicago, and other middle western points for the trade with Mississippi Valley Territory, there are the eastern cities, which have in the past enjoyed extremely low rates to the Mississippi River points—rates lower even than those to the intermediate interior section. These rates also have been revised, long-and-short haul departures done away with, and the distance principle given more recognition. Naturally this has brought about increases to the river points and Gulf ports.

Rates from Virginia Cities to Mississippi Valley.—The rate from the Virginia Cities to Memphis is $2 per hundred pounds, 1st class.[6] On traffic from the Virginia Cities and the East the territory is divided into three groups or zones, which are:

1. Memphis-Columbus-Meridian Group
2. Winona-Jackson-Hattiesburg Group
3. Mississippi River–Gulf Ports Group

The last-named group includes Baton Rouge, New Orleans, Mobile, etc. The 1st class rate to the second group is 10 cents higher than to Memphis, and to the third group it is 18 cents higher.

North Atlantic Ports to Mississippi Valley.—The 1st class rate from Baltimore to the Mississippi Valley is 14 cents higher than from the Virginia Cities, from New York and Philadelphia 11 cents over Baltimore, and from Boston 8 cents over New York.

The carriers in publishing rates to Mississippi Valley Territory have made them subject to a uniform percentage relationship of classes, which was prescribed by the Interstate Commerce Commission in connection with rates to Nashville.[7]

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[6] 64 I. C. C. 107.

Commodity Rates in Mississippi Valley.—The foregoing statements apply to the class rate structure, but the tendency is to apply the same general basis to the making of commodity rates. Thus, with commodity rates from St. Louis to New Orleans as a basis, the Commission has ruled that such rates to Mississippi Valley points other than New Orleans, shall not exceed rates which bear the same relationship to the St. Louis–New Orleans commodity rate that the St. Louis–New Orleans 1st class rate bears to the 1st class rate from St. Louis to these points. In other words, the ratio established for class rates is applied to commodity rates, and consequently, the distance principle is given general application in establishing rate relationships among destination points.

Carolina Territory Rates.—On traffic from the Virginia Cities, Carolina Territory is divided into five groups or zones. Rates from eastern cities to the Carolinas are built up by adding differentials to the rates from the same points to the Virginia Cities. From Cincinnati and Louisville to Carolina Territory the rates are the same, and from Evansville and Cairo the rates are differentials over those from Cincinnati, except to points south of a line which, roughly speaking, runs through Greenville, Columbia, and Sumter, S. C., to Wilmington, N. C. To this section of South Carolina, which is

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[7] I. & S. Docket 1261.

Class	1	2	3	4	5	6	A	B	C	D
Per Cent	100	86	76	64	52	43	29	35	27	24

sometimes referred to as "Southeastern Territory south of the Walhalla line," the rates from all of the Ohio River Crossings are the same. From North Carolina to South Carolina and to the southeast and Mississippi Valley, the class rates are made as differentials under those from the Virginia Cities. These differentials were fixed by the Commission.

Confusion in Southern Interior Rates.—The interior Southern adjustment presents a remarkable tangle of inconsistencies and discriminations. The old basing point system is still generally in effect. The rates between the principal Southern manufacturing or distributing points, such as Atlanta, Chattanooga, and Birmingham are extremely depressed, while the rate from any of these points to the local territory is generally the mileage scale of the individual line reaching the destination in question; or, where joint hauls are required, a combination of local rates. This has resulted in innumerable long-and-short haul violations.

The rate scales and classification exceptions of the railway commissions of the various Southern states serve further to complicate matters. No two states have adopted the same rate scales. Some states have laws forbidding long-and-short haul departures; others do not. Furthermore, the rules of the several states vary as to the construction of rates for joint hauls, some states requiring a deduction of as much as 20% or 25% from the combination of local rates, while others permit them to be made the full sum of the local rates to and beyond junction points. Naturally, the disposition of these rate-regulating bodies has been to prescribe rates on a level which will tend to allow the jobbers and other shippers within such states a decisive advantage against outside competition. Consequently, there are numerous complaints of discrimination in intrastate as compared with interstate rates. Again, in some cases the charge for the longer hauls under the mileage scales has been so much greater than for shorter hauls that there has been a serious variation from the principle of rate making that the rate per ton mile should decrease as the distance increases.

Moreover, the various states do not have the same classification and the spread between classes has varied widely and without reason; as, for example, in Alabama, 5th class has ranged from 50% to 71% of 1st class. Inconsistencies and discriminations can doubtless be found in any territory, but in the South where the situation has been complicated by the basing point system and the activities of the state commissions, the result has been an unusual confusion in rates with an extraordinary disregard for distance in rate making.

The Proposed Readjustment of Southern Rates.—Confronted with decisions of the Interstate Commerce Commission denying fourth section relief at points located on navigable water, such as Nashville (on the Cumberland River), Memphis, and New Orleans; and realizing the many inequalities and defects in the present rate structure, the Southern carriers have worked out and presented to the Interstate Commerce Commission a plan for a comprehensive and systematic revision of their class rates on a "dry-land" basis, eliminating long-and-short haul violations, except those necessary to allow the use of circuitous routes, and in general using distance as a guide. The case is now (1923) before the Interstate Commerce Commission for adjudication.

As a rule, the proposed adjustment follows the principles of the present system as to the relationship among rates from points of origin, such as the Ohio and Mississippi River Crossings, including St. Louis; and the former relationship of St.

Louis to the Ohio River Crossings, which was disturbed by the general advances of 1920, is substantially restored. The tabulation of proposed 1st class rates on page 383 illustrates this relationship. Generally, the proposed 1st class rates from the Ohio River to the Southeast are the same as have been approved by the Commission for northbound application.[8] No changes are proposed in the 1st class rates from these points of origin to Mississippi Valley Territory.

Readjustment of Rates to North Carolina.—The adjustment of rates from the Ohio River Crossings and the Middle West generally, to North Carolina, is a peculiarly difficult problem. The Chesapeake and Ohio, and Norfolk and Western, which are in Official Classification Territory, serve the ports of Norfolk and Newport News, Va. In order to secure a share of the export traffic from the upper Mississippi Valley and the Middle West in general, these Pocahontas roads have found it expedient to make rates to the ports of Norfolk and Newport News on a very low basis, distance considered. In spite of the longer haul, they have made their rates to these ports the same as to Baltimore. Then, in order to avoid violations of the long-and-short haul clause, they have carried these low rates back to the inland Virginia Cities of Richmond, Petersburg, Lynchburg, and Roanoke. Merchants at North Carolina cities, such as Raleigh, Winston-Salem, Greensboro, and Charlotte, in distributing goods in North Carolina, have to compete with jobbers located at the nearby Virginia Cities, and they have used every influence to induce the carriers to maintain a narrow spread over the Virginia Cities. The routes through the Virginia Cities from Ohio River points to North Carolina have exerted a controlling influence in the determination of the rates, which have heretofore been extremely low. In order to bring the level of these rates somewhat in line with rates between the Ohio River and other points in Southern Territory, it will be necessary to advance them substantially.[9]

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[8] In I. & S. Docket 1261.

From the Virginia Cities and the East to Carolina Territory no changes in the 1st class rates are proposed, the rates

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[9] The following comparison of 1st class rates, showing those in effect immediately prior to the 10% reduction of July 1, 1922, as "present" rates, illustrates the effect of the proposed revision from the Ohio River Crossings and St. Louis to typical destinations:

(All rates in cents per 100 lbs.)

TO		FROM			
Atlanta Sub-Territory		Cincinnati	Louisville	Evansville	St. Louis
Chattanooga, Tenn.	Present	119	119	119	165½
	Proposed	127	127	127	160
Rome, Ga.	Present	167½	167½	167½	216½
	Proposed	155	155	155	185
Atlanta, Ga.	Present	167½	167½	167½	216½
	Proposed	160	160	160	190
*Macon, Ga.	Present	167½	167½	167½	216½
	Proposed	175	175	175	205
Albany, Ga.	Present	205	205	205	256½
	Proposed	193	193	193	223
Valdosta, Ga.	Present	227	227	227	280
	Proposed	208	208	208	238
*Jacksonville, Fla.	Present	149	149	149	196½
	Proposed	208	208	208	238
Montgomery Sub-Territory					
Decatur, Ala.	Present	139½	124	124	170
	Proposed	142	127	127	160
Birmingham, Ala.	Present	167½	152	152	200
	Proposed	160	145	145	175
Tuscaloosa, Ala.	Present	184½	169	169	196½
	Proposed	170	155	155	185
*Montgomery, Ala.	Present	169	153	153	202
	Proposed	175	160	160	190
Troy, Ala.	Present	215½	200	200	252
	Proposed	190	175	175	205
Dothan, Ala.	Present	220½	205	205	256½
	Proposed	208	193	193	223
Mississippi Valley Territory					
Memphis, Tenn.	Present	151	136	136	136
	Proposed	151	136	136	136
New Orleans, La.	Present	208	193	193	193
	Proposed	208	193	193	193
Carolina Territory					
Winston-Salem, N. C.	Present	134	134	149½	192
	Proposed	175	175	200	230
Charlotte, N. C.	Present	164½	164½	180	231
	Proposed	175	175	195	225
Columbia, S. C.	Present	164½	164½	180	231
	Proposed	187	187	202	232

* Rates to these water competitive points are at present lower than to many intermediate points.

having already been revised under fourth section principles as previously stated.

Readjustment of Rates from Virginia Cities to the Southeast.—The existing rates from the Virginia Cities to the Southeast are on a depressed level, distance considered. There are several reasons for this. In the first place, there is the competition for traffic from the Middle West into the Southeast, between the carriers via the Virginia Cities with those via the Ohio River Crossings. The rates covering such traffic have heretofore been made on the lowest combination; these combination rates were only equalized via the different gateways to a limited extent. Again, the competition among carriers reaching the several Virginia Cities tended to depress the rates. As has been explained above, the rates from the West to all of the Virginia Cities are the same, regardless of distance, and the Southern roads which reach Norfolk and Richmond have heretofore made the rates from these points the same as from Lynchburg and Roanoke to all destinations in the Southeast and Mississippi Valley, although the distances from the last-named points are in many instances much less than from Richmond and Norfolk. This is particularly true of destinations to which the short line is through Bristol, Tenn. Finally, there is a water-and-rail route from Baltimore through Norfolk to the South, and fourth section observance compelled the use of Baltimore rates as a maximum from the Virginia Cities. Rates from the Virginia Cities to south Georgia points so made are about 20 cents, 1st class, lower than they need be, owing to the greater increases made in inter-terrtorial rates in 1920 from Baltimore than from the Virginia Cities and other border points lying within Southern Territory.

It is now recognized that the rates from the Virginia Cities into the Southeast are unduly low, and in revising them these principles are observed.

> 1. They are advanced to be more nearly in harmony with rates from the West to the same territory for similar distances.
>
> 2. The Virginia Cities have been divided into two groups in making rates to Atlanta and points west of Atlanta, one group including Lynchburg and Roanoke, and the other Richmond and Norfolk.
>
> 3. The rates to south Georgia territory are to be *not less than* from Baltimore via water and rail.

Under this arrangement the 1st class rate from the Lynchburg-Roanoke group to Atlanta is made the same as from Louisville and Cincinnati, namely, $1.60, while the rate from the Richmond-Norfolk group is made 8 cents higher.

Readjustment from Eastern Points.—From eastern points the rates to Atlanta and other points in Georgia and eastern Tennessee are left practically unchanged. To Birmingham, Montgomery, and Selma, Ala., the 1st class rate is to be made 15 cents higher than to Atlanta, this being the differential in the rates from Louisville, St. Louis, and similar points to Atlanta over Birmingham. To Mississippi Valley points it is as a rule necessary to advance the rates 10 cents, 1st class, to make them fit into the rest of the adjustment.

The following figures (cents per hundred pounds) will illustrate the adjustment from Virginia Cities and the East:

TO		FROM							
		LYNCHBURG ROANOKE	RICHMOND NORFOLK	BALTIMORE		NEW YORK PHILADELPHIA		BOSTON	
				W & R	AR	W & R	AR	W & R	AR
Atlanta, Ga.	Present	156½	156½	188½	198½	200	210	208½	218½
	Proposed	160	168	188	198	200	210	208	218
Chattanooga, Tenn.	Present	156½	156½	188½	198½	200	210	208½	218½
	Proposed	158	168	188	198	200	210	208	218
Valdosta, Ga.	Present	167½	167½	188½	198½	200	210	208½	218½
	Proposed	188	188	188	198	200	210	208	218
Birmingham, Ala.	Present	167½	167½	196½	206½	208½	218½	216½	226½
	Proposed	180	188	203	213	215	225	223	233
Tuscaloosa, Ala.	Present	199	199	226½	226½	238½	238½	246½	246½
	Proposed	188	193	213	213	225	225	233	233
Memphis, Tenn.	Present	200	200	214	214	225	225	233	233
	Proposed	200	210	224	224	236	236	244	244
Jackson, Miss.	Present	210	210	224	224	235	235	243	243
	Proposed	210	220	234	234	246	246	254	254
New Orleans, La.	Present	218	218	232	232	243	243	251	251
	Proposed	218	228	242	242	254	254	262	262

W & R means Water and Rail.
AR means All-Rail.

Through Rates from C. F. A. Territory Proposed.—The most difficult feature of the revision was the question of rates from Illinois and Central Freight Association points to the South. For many years there have been certain through rates from all of this Middle Western territory to the South, such as those to the lower Mississippi River points, Memphis to New Orleans, and to the Gulf ports. Through rates have recently been established from Chicago and other Illinois points to interior Mississippi Valley points, but not from C. F. A. Territory. The rates which have heretofore applied from all of the territory in question to the Southeast and the Carolina territories, have been combination rates based on Ohio River Crossings.

The Southern lines have proposed the establishment of through rates substantially less than the combination rates, but naturally do not desire to sacrifice revenue as a result. The proposed 1st class rate from Detroit to Greenville and Columbus, Miss., was $2.10, which is the maximum that could be applied under fourth section principles from Detroit to Birmingham. The short-line distances from Detroit to both Birmingham and Atlanta are through Cincinnati and are approximately the same. It is, therefore, considered proper to make the rate from Detroit to both points $2.10, and the rate from Chicago to Atlanta is made the same as from Detroit. Deducting from this figure the rate of $1.60 leaves a difference of 50 cents to apply between Chicago and Louisville, which is 56% of the present rate between those points.

In order to afford a consistent relation between points of origin, the proposed rates from the whole territory were worked out on a differential basis. The differential was, as a rule, made approximately 56% of the local 1st class rate from each point or group of points to the nearest Ohio River Crossing. This results in making the rates from Chicago to Atlanta the same as from New York, all-rail, namely, $2.10, and means a reduction of 47 cents, 1st class, in the former combination rate of $2.57, with corresponding reductions to the Southeast generally.

From the eastern part of C. F. A. Territory to the lower Mississippi River Crossings and Gulf ports the rates were advanced sufficiently to present an adjustment consistent with that proposed to the Southeast. To Carolina Territory a similar basis is used, the through rates not being higher than those made by combination of the local rates via the Virginia Cities.

Rates from the Buffalo-Pittsburgh zone have been proposed on the same basis as from Central Freight Association Territory.

Rates from Carolina Territory to Southeastern and Mississippi Valley points are made as differentials under the rates from Richmond, Va., the distances being somewhat less.

Readjustment within the Southeast.—In place of the existing confused rates between points within the Southeast, the carriers have proposed a consistent readjustment conforming to the long-and-short haul clause in which distance has been followed as a guide. A mileage scale covering distances up to 460 miles has very generally been proposed as the basis and is in all cases observed as a maximum. This scale—which resembles the C. F. A. Scale in construction—begins with 30 cents, 1st class, for hauls of 5 miles and less, and is graded up to reach $1.60 at 460 miles, which is approximately the average distance from the Ohio River Crossings to Atlanta. At the hearing on these rates one of the carriers' witnesses presented data to show that the average actual terminal expense, without adding anything for the cost of transportation, is 30 cents per 100 pounds on less-than-carload merchandise.

The carriers propose to eliminate all less-than-carload "exceptions" to the classification. Carload "exceptions" would be temporarily retained and replaced later by commodity rates. These exceptions are so lacking in uniformity and consistency that their elimination is essential to a non-discriminatory rate structure.

Summary.—Railway freight rates in the Southeast have been relatively low, considering the sparseness of the traffic. In the first place, water competition has made the rates from the North to the South especially low. The rates to the South Atlantic and Gulf ports are held down by direct water competition, while those from the East to the interior Southeastern points must be made with relation to the water-and-rail rates, the level of which is strongly influenced by potential water competition at many jobbing centers located on navigable rivers, such as Augusta, Macon, and Columbus, Ga., Montgomery and Selma, Ala., and Nashville, Tenn. Mississippi River points, such as Memphis, Vicksburg, and New Orleans have had the advantage of extremely low rates from Chicago, St. Louis, and Central Freight Association Territory, generally, on account of water competition on the Mississippi River. The low rates to Atlanta have held down the rates to the intermediate Carolina Territory. The rates from the West to the Virginia Cities are abnormally depressed, and this situation has been reflected in the rates to the nearby North Carolina cities. Finally, competition between the carriers has caused very low rates between interior southern manufacturing and distributing centers, and between such points and the southern ports for relatively short hauls.

In general, it may be said that in the past distance and cost of service have, in too many instances, not been given proper consideration in the fixing of rates in the South. Furthermore, lack of uniformity in rate scales, the great number of classification exceptions, and the discrimination arising from the activities of the state rate-regulating bodies, have brought about a situation where only a radical revision along systematic lines can prevent the continuance of the dissatisfaction and litigation which have been so common in the past. It is to meet these conditions that the carriers have undertaken a readjustment of freight rates so far-reaching. In general, the principles underlying the revision submitted to the Interstate Commerce Commission may be summed up as follows:

1. *Distance is given careful consideration* in fixing the new rates, but groupings of origins and destinations have been retained where experience has shown them to be fair to all interests. The adjustment proposed in this respect may be said to resemble somewhat the system of rates between Eastern Trunk Line Territory on the one hand, and Chicago and C. F. A. points on the other hand. For the short hauls, distance is made the controlling factor, rates for the distances up to 200 miles having been made almost invariably on a mileage scale.

2. *Water competition has been ignored to the greatest extent practicable* and the rates placed on a "dry-land" basis, long-and-short haul departures via the direct lines being eliminated. The Commission has been asked, however, to grant the relief necessary to allow circuitous lines or routes to meet the rates initiated by the direct lines without applying them as maximum rates at intermediate destinations on the indirect routes beyond the equidistant points. This relief is necessary because there are many routes over which traffic can be handled from the North into the South, all of which are in strong competition with one another, and the same situation exists between points within the South. If the application of rates to competitive points were restricted to the shortest routes between any two points, the result would probably be congestion on the direct lines and, furthermore, the public would be deprived of the advantage which it derives from competition between the carriers.

3. *Rates will be made the same in both directions.*

4. It is the plan of the carriers to *do away with the numerous existing discriminations* between shippers having the advantage of *intrastate* rates and those using *interstate* rates.

5. *Exceptions to the Southern Classification on merchandise traffic are to be discarded,* thereby removing undue discriminations and preventing the continuance of the confusion and dissatisfaction arising from the existence of dozens of different classifications and exception sheets within a limited area.

6. A *uniform percentage relationship of classes* has been suggested for the purpose of making each class of merchandise bear its proper proportion of the total cost of transportation, and for the further purpose of bringing the relationship of classes in the South nearer to that in effect in other sections of the country, thereby simplifying the problem of working out a uniform classification for the country as a whole.

An important feature of the new plan is that it tends to break down the isolation of the South as a traffic territory. Under the new arrangement through rates are proposed from C. F. A. Territory to the entire South, instead of the former combination rates which were constructed by combining the Northern rates to the Ohio River Crossings or the Virginia Cities and the rates from those points to the South. The establishment of these through rates would consequently reduce the advantage of Louisville and other Ohio River points and the Virginia Cities, but favor the manufacturers in C. F. A. Territory. It is part of the plan of the carriers, which they have not yet fully worked out, to follow this up with the publication of through rates on commodities moving from Western Trunk Line Territory and from points in Texas and the rest of the Southwestern territory.

Water Competition.—In conclusion, we may note that ocean competition will always strongly affect Southern rates. It is this competition which enabled the water and rail routes to control the adjustment of rates from eastern cities to the greater part of the Southeast, including all points east of Chattanooga, Birmingham, and Selma, which is known as "differential territory."

If the rail rates to this territory were put on a strictly distance basis, the charges through the South Atlantic ports, even if made a combination of rates to and beyond these ports, would be so much lower than via all rail to many destinations as to make it impossible for the rail lines to compete for the traffic. This is unquestionably true of points near the coast, such as Macon and Valdosta, Ga., and probably of points as far west as Columbus, Ga. Just as the rates across the continent to San Francisco are affected by the Panama Canal to a greater extent than are those to a western inland point such as Reno, so there will always be a tendency toward lower rates to points in Southern differential territory. Moreover, competition between these differential points and others farther inland will tend to hold down the rates from Central Freight Association Territory points to all the Southeastern Territory.

Thus we see how complicated is the establishment and maintenance of a uniform rate structure throughout the South on a dry-land or distance basis.

CHAPTER XXIV

THE TRANSCONTINENTAL RATE STRUCTURE

The Territory.—The problem of transcontinental rates originally concerned only traffic shipped to Pacific Coast ports. With the development of the West, however, traffic to intermediate points in the Rocky Mountain states came to be involved, the rates to such points being based on the rates to the coast. The carriers immediately concerned were those whose lines extended west of the Missouri River. Transcontinental rate territory may be said roughly to include the coast states of California, Oregon, and Washington; and in addition the states of Nevada, Montana, northern Idaho, and the western parts of Utah and New Mexico.[1] Vancouver and Victoria in British Columbia also lie in this territory.

As the name "transcontinental" implies, the problem to be discussed in this chapter concerns rates between Transcontinental Territory and other territories to the east—not rates within Transcontinental Territory. Eastern Territory, from the transcontinental point of view, includes all of the United States east of a line extending northward from El Paso, Tex., west of Denver and Cheyenne, to the head of Lake Superior (see Fig. 31).

The Background of the Transcontinental Rate Problem.—At the bottom of the Transcontinental rate problem lies water competition and especially competition via the Panama Canal. Prior to the opening of that canal the railways were able to meet the competition of ocean carriers by way of Cape Horn or by the Gulf of Mexico and the Tehuantepec route without much difficulty, and a satisfactory adjustment of rates was reached with relative ease. The opening of the Panama Canal, however, cut the sailing time by at least two-thirds and required sharp reductions in the all-rail rates across the continent to the Pacific ports. Rates to and from Pacific Coast ports had to be made so low that if they had been applied to all western points the Transcontinental roads would have lost money. Accordingly, they made the reductions applicable only to coast territory where they met the competition of the ocean carriers, and charged higher rates to intermediate points on their lines.

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[1] See Fig. 27, page 329.

The higher intermediate rates were made on the basing point system, that is, the rate to such a point as Spokane, Wash., was made by taking the rate to Seattle and adding thereto the local rate back from Seattle to Spokane.

The Subdivisions of Transcontinental Territory and Diverse Interests.—This situation has given rise to two great rate territories, each of which contains two different and conflicting interests:

1. Transcontinental Territory, the extent of which has already been stated, may be divided between the coast points and inter-mountain, or back-haul territory. (a) The coast points include Pacific Coast terminals.[2] (b) East of these coast towns lies the inter-mountain territory including such points as Spokane, Walla Walla, Yakima, in Washington; Pendleton and Huntington in Oregon; Reno, Nev.; Marysville and Fresno, Cal.; and Phoenix and Prescott in Arizona. This territory is divided into "California Intermediate Ter-

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[2] Aberdeen, Anacortes, Bellingham, Cosmopolis, Everett, Hoquiam, Seattle, South Bellingham, and Tacoma, Wash.; Astoria and Portland, Ore.; New Westminster, Prince Rupert, Vancouver, and Victoria, B. C.; and East San Pedro, Oakland, Richmond, San Diego, San Francisco, San Pedro, and Wilmington, Cal.

ritory" and "North Pacific Intermediate Territory," with several subdivisions within each sub-territory.

These two groups in the Western Territory have diverse interests in that the coast towns support the carriers in their tendency to make low rates to the terminals and retain higher rates to the intermediate points, while the inter-mountain towns resist this tendency and demand that the railways make rates to them which shall be at least no higher than to the coast.

It is to be noted that the contentions of the inter-mountain shippers are based upon jobbing interests rather than upon those of manufacture. The jobbers in the inter-mountain territory are in competition with jobbers on the coast, and they resent lower rates to the coast which enable the jobbers there to secure goods at less cost and come back into the territory occupied by them. There is relatively little manufacturing in this region and it depends for its manufactured products largely upon the territory lying east of the Mississippi River and north of the Ohio.

2. The Eastern Territory is occupied by two diverse interests consisting of: (a) the Atlantic Coast ports and interior points adjacent thereto, and (b) middlewestern points centering around Chicago. The Atlantic ports desire to retain the full benefit of the low water rates from coast to coast and object to the making of low rail rates from middlewestern points which would enable the manufacturers there to compete with them on the Pacific Coast. On the other hand, the middlewestern points insist that it is for the benefit of the whole country that they should be allowed to find an outlet for their products in western markets in competition with the eastern seaboard producers, and to that end demand low Transcontinental rail rates.

Their claim is not based so much upon the existence of direct water competition by way of the Panama Canal—

although the rail-water rate via New Orleans or Galveston and the Gulf of Mexico does enter the question—as it is upon market competition: the middlewestern points desire to be given rates which will enable them to compete with the Atlantic seaboard for the markets of the Pacific Coast. Of course, they also insist on the advantage of a shorter rail haul.

As a result of market competition between eastern and middlewestern points, Transcontinental commodity rates, both east and westbound, have been largely "blanketed," and are often the same to or from the middle west as to or from the Atlantic Coast.

A third distinct interest might be added to those in Eastern Territory, for Missouri River points desire to be included with middlewestern points, such as Chicago, in securing the low rates to the coast on the ground of water and market competition. For example, at a hearing in November, 1921, the Chambers of Commerce of Hutchison and Wichita, Kan., were represented and insisted that their relative nearness to the coast entitled them to share on a percentage basis in proposed low rates from more eastern points.

With this sketch of the territory and the interests involved in mind, we may now consider recent developments in the Transcontinental rate structure. It is to be remembered that in the Transcontinental rate structure "commodity rates" are much more important than "class rates," and carload shipments greatly predominate. The spread between the carload and the less-than-carload rates is wide. Accordingly, most of what follows concerns commodity rates on carload shipments.

History of Transcontinental Rates.—In 1910 the Interstate Commerce Act was amended so as to give the Interstate Commerce Commission greater power to prevent violations of the long-and-short haul principle, the amendment requiring the carriers to apply to the Commission for authority to continue each individual departure from that principle. Accordingly, the carriers made application for a continuation of the relatively low rates which they had been charging from the East to Pacific Coast points, while the inter-mountain cities, among which Reno was prominent, objected.[3]

In 1911 the Commission handed down a decision which, while it granted the "relief" from the long-and-short haul clause requested by the carriers, somewhat modified the old rate structure in the direction of reducing the discrimination against inter-mountain points. Very briefly stated, the Commission's decision authorized lower rates from the East to the coast than to inter-mountain points, but limited the amount of the difference in rates from those eastern points at which water competition was not actually effective.

This idea was carried out dividing the Eastern Territory into five groups and authorizing the railways to charge rates from the various groups to inter-mountain points which differed widely in the amount by which they exceeded the rates to coast points. Group IV embraced Trunk Line and New England Territories, from which water competition is most effective, and from this group the carriers were authorized to apply such low rates to the coast that they could add 25% thereto in making their rates to inter-mountain points. At the other extreme was Group I, which embraced all Eastern Territory west of and including Duluth, St. Paul, Omaha, and a line south to the Gulf. From Group I points, rates to the coast points could not be lower than rates to inter-mountain points. In between lay Groups II and III, including respectively, Chicago together with middlewestern points, and Buffalo-Pittsburgh territory. From these groups, rates to the inter-mountain region could exceed those to the coast by only 7% and 15% respectively. Southeastern Territory was included in Group V, and down to 1918 no through rates were available from this group. Then the United States Director-General ordered through rates to western points similar to those from the territory north of the Ohio.

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[3] See *Reno Case,* 19 I. C. C. 238.

This arrangement, which allowed the maximum discrimination to coast points from seaboard territory and graded down the amount of discrimination till it reached zero in Missouri River territory, both operated to help the middle-western manufacturer by giving him somewhat lower rates to the coast, and at the same time protected the inter-mountain jobbers sufficiently to allow them to maintain their business in competition with the jobbers at Missouri River and Pacific Coast points.

Nevertheless, the Commission's decision was protested and was enjoined by inferior courts. In 1914 the Supreme Court upheld the decision,[4] and the arrangement above described became effective.

Panama Canal Competition.—Meanwhile, the Panama Canal had come into operation, in 1914, and had begun to make water competition more intense. The canal both reduced the operating expenses of ocean carriers and enabled them to give better service. Consequently, they reached further inland from both the eastern and western coast terminals, and took a growing volume of traffic from the railways. In 1915, therefore, the Interstate Commerce Commission authorized still greater "relief" to the rail carriers in the way of enabling them to make lower rates to the coast without reducing their charges to inter-mountain points.[5] This was done (1) by changing the amount of relief from the long-and-short haul clause which was given to the different rate groups in Eastern Territory, and (2) by dividing the traffic into three groups according as it was more or less subject to water competition.

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[4] *Inter-mountain rate case,* 234 U. S. 276.

[5] 32 I.C.C. 611.

Schedules of Commodities.—One of the most important parts of this arrangement was the classification of commodities into three "schedules": Schedules A, B, and C. Schedule A included traffic which was not affected by water competition, such as musical instruments, glass, and bicycles, and on commodities which fell under this schedule no lower rates were authorized to the coast than to inter-mountain points. Under Schedule B came commodities such as agricultural implements and light sheet steel, on which water competition was only potential or slightly effective, and the rates on such commodities were allowed a maximum discrimination against the inter-mountain points of 25%, which was the same as in the 1911 arrangement. Schedule C, which included the greatest volume of traffic, consisted of commodities, such as iron and steel articles, paint, paper, and stoves, on which actual water competition was keen, and the carriers were authorized to make greater discrimination against inter-mountain points under conditions described in the next section.

Territorial Groups.—The basis for the rates on Schedule C commodities from all the eastern groups was laid in the rates from Missouri River territory (including what the carriers call Group F points and those west thereof). It was provided that when the rate to the Pacific Coast terminals was not extremely low—that is, when it was 75 cents or more—the rate from the Missouri River territory to intermediate points was to be not less than that to the coast terminals. In other words, for cases in which a rate of 75 cents or more could be charged, no relief from the long-and-short haul clause was given to Missouri River territory on shipments to the coast. When, however, the rate to the Pacific Coast terminals was less than 75 cents per hundred pounds, it was provided that the rate to intermediate points might be somewhat higher but should not exceed 75 cents per hundred pounds. Under this provision the carriers might make as low rates as they desired on traffic to the coast, but when they made very low rates they could not exceed 75 cents to the inter-mountain points. This changed the situation from that existing under the Commission's ruling of 1911, in that the earlier ruling afforded no relief to Missouri River territory, while the later one allowed a limited relief in the case of rates which were under 75 cents per hundred pounds.

From the rate groups which lay east of the Missouri River territory, rates to the inter-mountain points were authorized which would exceed those from Missouri River territory by certain fixed amounts, ranging from 15 cents to 35 cents on carload traffic, and from 25 cents to 55 cents on less-than-carload traffic. For example, carload rates to inter-mountain points from Chicago–St. Louis territory (embracing the carrier's rate Groups D and E) might be as much as 15 cents higher than the rates from Missouri River territory; while from Boston–New York–Philadelphia territory (Group A points) carload rates to inter-mountain territory might be as much as 35 cents over those from Missouri River territory. Clearly, the whole scheme hinged on the Missouri River rates, and as already stated, the provision there was that in the case of rates under 75 cents the carriers might go as low as they pleased in their charges for the haul to the coast terminals, while maintaining a rate of not over 75 cents to the inter-mountain points.

One effect of this arrangement was to give a decided advantage in inter-mountain territory to middlewestern points such as Chicago, both in the jobbing business and in manufacturing.

Reduced Water Competition Brings Long-and-Short Haul Application.—The foregoing commodity rate adjustment, while well adapted to meet the needs of the time, was soon forced out of existence by changing conditions. To begin with, the canal was blocked by a serious slide during parts of 1915 and 1916. At the same time, the great European War had created a demand for ocean shipping which made it profitable to divert tonnage from the inter-coastal trade. As a result of these things, canal competition ceased to exist. During 1916 various adjustments to meet the new situation were proposed, but the final settlement came about through a case brought by one of the inter-mountain cities, Spokane, which claimed that under the changed circumstances there was no good reason for lower rates to the coast than to the back-haul territory.

In 1917, the Interstate Commerce Commission handed down a decision which wiped out practically all the old rate adjustment. It decided that (1) not only were the rates under Schedules B and C to the Pacific Coast terminals too low, but that (2) the westbound commodity rates to the terminals should not be lower than those to the intermediate points; and that (3) the eastbound commodity rates on barley, beans, etc., should be adjusted according to the long-and-short haul principle. In making this decision, the Commission recognized that the new adjustment probably could not be maintained permanently, but it seemed to be the logical thing in view of the virtual disappearance of water competition.

Accordingly, in 1918, when certain inter-mountain cities, emboldened by the success of Spokane in 1917, sought to induce the Commission to go further and grade rates on a distance basis so that those cities would enjoy lower rates from and to the East than the coast terminals, the Interstate Commerce Commission refused to grant their request. Water competition was already beginning to become effective again. From that time on, traffic by way of the canal increased until in 1922 the tons of cargo carried through the canal in United States vessels were 4,950,000, and the coast-to-coast traffic was about 25% of the total canal tonnage.

Present Commodity Rate Adjustment.—As a result, the Transcontinental railways sought relief in the shape of lower westbound rates to the coast. In spite of the water competition, however, the Commission felt compelled to deny the railways' petition almost in its entirety.[6] The only relief given from the provisions of the long-and-short haul clause was on barley, beans, canned goods, rice, dried fruit, and asphalt from the California terminals to New York via Galveston; and on crude sulphur from points in Louisiana and Texas to San Francisco and northern Pacific terminals. Thus the status of domestic Transcontinental rates at present is much the same as that which came into existence under the decision of 1917, and in most cases the rates to and from the Pacific Coast are the same as or similar to those which apply to and from inter-mountain cities.

As a result, the Transcontinental railways were in 1922 and 1923 much handicapped in their competition with the inter-coastal water carriers and they lost a great deal of tonnage.

Restoration of Old Rate Structure Refused by Commission.—The reasons for the Commission's refusal to restore the old situation which allowed lower rates to the coast are chiefly based on the Transportation Act of 1920.[7] Under this Act, the application of the long-and-short haul clause is made more stringent. It is provided that the Commission must specifically authorize any relief from that clause, and that in giving such relief it shall not go so far as to allow any charges which

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[6] 74 I. C. C. 48 (November, 1922.)

[7] See page 545.

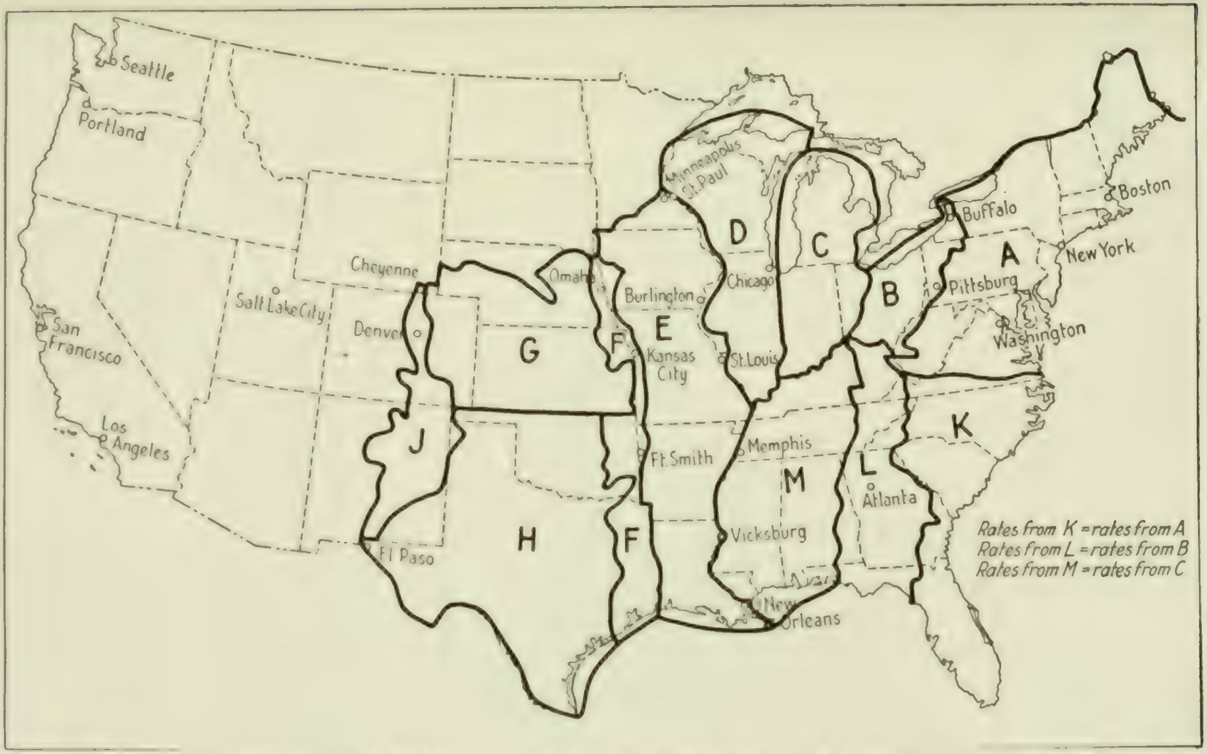

Fig. 31.—Groupings of Eastern and Middlewestern Points on Traffic Destined to Transcontinental Freight Bureau Territory

are too low to be reasonably compensatory for the service performed. In making its decision the Commission also noted that Congress had expressed itself in favor of aiding water competition.

The principles which governed the Commission were stated as follows:

> 1. Rates must be more than enough to cover the extra or additional expense of handling traffic. That is, rates to the coast could not be made so low that there would be any doubt in the Commission's mind as to their being reasonably compensatory.
>
> 2. Rates must not be so low as to impose a burden on other traffic, which is to say that rates to the coast would not be authorized if they should seem so low as to compel traffic to the inter-mountain points to pay higher rates than would otherwise be necessary.
>
> 3. Rates must not jeopardize a fair return on the value of the carrier's property (as provided in Section 15a of the Act).
>
> 4. Rates must not be low enough to threaten the existence of water carriers.

It is apparent that a great deal of rather exact cost data will be required to demonstrate to the Commission that the carriers are warranted in making lower rates to the coast than to intermediate points. The competitive situation can no longer be the determining factor.

Class Rates.—In making Transcontinental "class rates," the eastern half of the country is divided into twelve zones called "groups," and lettered from A to M (Fig. 31). This arrangement is illustrated by the following table of class rates to California terminals, the rates being quoted in cents per 100 pounds. (Classes 3-4 and B-D omitted.)

To points taking terminal rates (via all-rail routes) from points taking	CLASSES				
	1	2	5	A	E
Group A and K rates.....	555	480	285	288	158
" B and L "	540	465	277½	281	150
" C and M "	525	455	270	273	147
" D "	510	443	263	266	135
" E "	495	428	252	258	128
" F "	450	390	240	240	117
" G "	420	363	225	225	117
" H "	420	363	225	225	117
" J "	366	317	197	197	95

Group A extends from the Atlantic Coast to Buffalo-Pittsburgh territory; Group D includes most of Illinois and Wisconsin; Group F embraces Missouri River points; etc. The groups lettered K, L, and M are the Southeastern counterparts of A, B, and C, respectively, and take the same rates.

The class rates to North Pacific terminals are the same, except that, on account of greater distance, the rates from Groups G and H are somewhat higher. The interior western coast points take the same rates as the coast terminals, while such inter-mountain points as Reno and Spokane have somewhat lower class rates.

The eastbound class rates are much the same as the westbound, but tend to be somewhat higher in the case of inter-mountain cities.

CHAPTER XXV

EXPORT AND IMPORT RATES

Relation of Export and Import Rates to Foreign Trade.—A moment's reflection will show that there is a close relation between railway rates and foreign trade. Indeed, in foreign countries, it has long been a part of systems of protection to domestic industry to make special adjustments in railway freight rates, either in the way of reductions to encourage domestic producers, or of increases to protect the home markets from the competition of imported commodities.

The effect of railway rates on foreign trade may be exerted in several ways. Such rates, being a part of the cost of transporting goods to foreign ports, may, if they are not properly adjusted, be so high as to prevent domestic manufacturers at interior points from competing abroad. Or, on the other hand, the rates may be so high as to prevent interior points from competing at domestic ports and territory adjacent thereto, with the imported products of foreign producers. As illustrating this latter condition, the United States manufacturers of heavy chemicals have complained bitterly that although they have brought their prices, f.o.b. works, down to a point where they are as low as, or lower than the prices of foreign producers who are shipping goods into this market, they are unable to compete successfully because of the high freight rates which prevail from their works at interior points to the seaboard. As one of the principal markets for such chemicals as caustic soda is in New England, it is obvious that competition with England makes the domestic freight rate an important factor.

One phase of this matter is the part that rail rates on imports may play in encouraging domestic industry. For example, there are special import rates via Pacific ports on copra, which is the raw material for producing a certain kind of vegetable oil. These rates are made low by the railways to enable the crushers at interior points to compete on the Pacific Coast with the oil imported from the Orient.

In short, railway rates, whether so designed or not, may be regarded as a part of the protective system. During the European War the question of protection to domestic industries lost its importance for a time and export and import rates were largely abolished; but at the end of the war when the question of protection was again raised, the high railway rates were subject to a special complaint from the point of view of exporters and industries which demanded protection. It appeared that it was possible for the foreign producers of many commodities, including some farm products, to sell their goods on the American seaboard at lower prices than producers in the United States could make f.o.b. seaboard, and it was intimated at the White House that in readjusting railway rates due regard would be given to the extent of the tariff barrier which would be imposed upon imports. If transporting charges could be reduced, such reduction would make it unnecessary to place high tariffs on the products involved.

General Nature of Export and Import Rates.—Export and import shipments between the United States and non-adjacent foreign countries all move on "combination rates," that is, on rates which are made by taking the sum of the railway's charge to or from seaboard and the steamship rate beyond the port.[1]

But although the rail rate to the port is thus nominally separate, it may be regarded as in reality a "proportional" rate, or part of a sort of through rail-and-water rate. Export and import rates are special rates made by the carriers to and from ocean ports, applying only on traffic which originates or terminates in foreign countries. In other words, these rates are made available only when the traffic is actually for export or import. Consequently, in practice the ocean and the rail rates must, in the long run, be interrelated.

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[1] To Canada and Mexico joint through rates are made.

If no special export or import rates are named, however, the domestic rail rate must be used, plus such separate terminal or port charges as may be involved. Railway tariffs sometimes make the domestic rate include these charges.

As illustrating the special character of export and import rates it may be noted that the shipper must take care to see that such rates are actually applicable to the particular country and port which he has in mind; for a rate may apply between given ports on imports but not on exports, or it may only have a limited application to or from some designated port within a foreign country.

Export Bills of Lading.—The special character of export rates is further illustrated by the fact that export traffic may move on two different kinds of bills of lading: (1) through export bills of lading, and (2) domestic bills of lading.

The carriers generally have arrangements with steamship companies for through export bills of lading, covering the movement of a shipment from the interior point of origin to the foreign destination, and the Interstate Commerce Commission Act (Section 25) provides that the carriers shall name separate charges for the rail and water portions of the through export rate and also the port charges if these are not included in the foregoing. "In all such cases, it shall be the duty of the carrier by railroad to deliver such shipment to the vessel as a part of its undertaking as a common carrier"; but the railway is not liable after delivery has been made to the vessel.

Goods, however, may be shipped to the port on a domestic bill of lading made in care of some person authorized to receive them and then be shipped out on an ocean bill of lading.

Import traffic generally comes into the ports on ocean bills of lading and then moves to interior points on domestic bills; but imports via Pacific Coast ports often move on through import bills of lading.

Changes in Export and Import Rates.—In view of the special significance of export and import rates and the fact that they are subject to peculiar competitive influences, they are made subject to change on much shorter notice than is the case with domestic freight rates. The law states that "in consideration of unusual and special circumstances surrounding the movement of traffic" for export or import, such rates may be reduced on only three days' notice and may be raised on ten days' notice. Obviously, this provision facilitates rapid change in such rates and it is not surprising to find greater fluctuations therein.

In view of the foregoing fact, importers should observe that the rail rate which is in force at the time an import shipment arrives is the one which will govern. Thus, in one case, a shipment of linoleum left Hamburg for San Francisco at a time when the rate in force on a through shipment via New Orleans was $1.10. Upon arrival at New Orleans, however, it was found that the through rate had been canceled, leaving in effect a local rail rate from New Orleans to San Francisco of 90 cents, which was greater than the rail proportion of the through ocean-rail rate had been. Upon application for a refund down to the $1.10 through rate, the Interstate Commerce Commission ruled against the shipper, thus establishing the principle already stated.

Application of Long-and-Short Haul Clause.—One respect in which export and import rates have a special significance concerns the application of the long-and-short haul clause of the Interstate Commerce Commission Act, which, it will be remembered, requires that rates shall be made with some reference to distance. This clause applies to export and import rates, but in its application an export rate must be compared with another export rate, and an import rate must be compared with another import rate. Export and import rates, in a word, are not to be limited by the domestic rates between the same points of origin and destination. An import rate, for example, covering a shipment from Galveston to San Francisco may be lower than the domestic rate applying between the same points over the same route.

Chief Groups of Ports.—Before taking up the general statement concerning export and import rates which follows, it will be well to recall the various groups of ports in the United States through which such rates are made. These ports may be classified as follows:

1. North Atlantic ports:
    - (a) New York
    - (b) "Out ports" (Boston, Philadelphia, Baltimore, etc.)
2. South Atlantic ports:
    - (a) Virginia ports (Newport News, Norfolk, etc.)
    - (b) Wilmington, Charleston, Savannah, Jacksonville
3. Gulf ports:
    - (a) Texas (Galveston, Houston, Port Arthur, etc.)
    - (b) Other Gulf ports (New Orleans, Mobile, Pensacola, Gulfport, etc.)
4. Pacific Coast ports:
    - (a) North Pacific ports (Seattle, Portland, etc.)
    - (b) California ports (San Francisco, Port of Los Angeles)

The various Canadian ports should also be considered, as both exports and imports between the United States and foreign countries may pass through Montreal, Halifax, or St. John on the east, and Vancouver on the west—to mention the chief ones.

General Characterization of Import and Export Rates.—The chief import and export rate structures exist between the Central West and these various groups of ports, though export and import rates of importance also apply between southern interior points and the South Atlantic and Gulf ports. The reason for this fact, of course, is that each port enjoys natural advantages in the territory adjacent to it—its "hinterland"—and this determines the flow of most export and import traffic within a fringe of territory lying all along the coast without any special rate adjustments. The chief problem thus arises with regard to the movement of traffic from the center of the country—the Central West.

The structure of import and export rates may differ from the domestic rate structures in two respects: (1) the export or import rates may be lower (or in exceptional cases[2] higher) than the domestic rates; (2) they may establish a relationship between various points which is different from that which exists on the basis of domestic rates. Frequently groups of ports are "equalized" for export traffic, while the domestic rates to those ports are different.

As a rule, export and import rates are lower than the domestic rates between the same points[2]; which comes about not so much from a desire of the carriers to protect American industry as from the force of competition.

Reasons for Lower Export and Import Rates.—The chief reason for the relatively low export and import railway rates is to be found in the greater competition which affects foreign trade. Such trade may be subject to world competition. Consider the large number of competing routes which may be taken by a shipment from Liverpool to some interior point in the United States, such as St. Louis or Denver. The shipment may be brought by different steamship lines to Montreal, Boston, New York, Philadelphia, Baltimore, Norfolk, New Orleans, or Galveston—to mention some of the more probable possibilities. From these points it may move by a score of different rail or rail-water routes to the interior. Or a shipment from China to New York might go east via San Francisco and rail, or Vancouver and rail; east via the Panama Canal by an all-water route; or west via the Suez Canal to its destination. Rival seaports are actively seeking to secure the lowest rates inland with the object of building up their traffic. The railways, in their turn, are striving to develop the industries of those sections of the country which they serve. And finally, various industries bring pressure to bear to secure relief through reduced carrying charges from the restrictive effect of protective tariffs. All these forces tend to keep export and import rates at a relatively low level.

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[2] The only exceptions appear to arise from the process of equalizing various ports.

Special import rates, however, have, in the United States, been more numerous than the export rates, for the reason that such rates apply mostly either on the raw materials desired by our manufacturers or upon finished products which are not produced in this country. This indicates that one idea in making low import and export rates has been closely akin to that of "protecting" domestic industries. Even import rates, however, only apply to a relatively small part of the total quantity of commodities brought into this country from abroad.

Free Time.—Both in judging the relative level of export and domestic rates and in determining port equalization, the special services given by the carriers at terminals must be considered. If free lighterage[3] to shipside is given, or if a long period of "free time" is allowed, it is an important factor. At New York and other North Atlantic ports it is customary for the carriers to allow shippers from ten to fifteen days' time in which to make disposition of shipments for export, during which time no demurrage (penalty for failure to unload within a specified time) is charged. If shipped on through export bills of lading, the longer time is allowed. Similar allowances are made at Pacific ports, while at others the allowance is irregular or is for a shorter period.

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[3] Transfer by barge from railway pier to a ship at some other pier or anchorage.

Import and Export Rate Structure.—In order to understand the present developments pertaining to export and import railway rates, some reference should be made to recent history and to conditions before the war, as normal conditions have not yet been entirely restored.

On June 25, 1918, an order of the Director-General of Railways canceling all export and import rates became effective. This order, however, was made to apply only to the North Atlantic and Pacific ports, and as to the Pacific ports import rates were soon restored on many commodities on which there were no domestic commodity rates. For example, prior to June 25, 1918, there was an import commodity rate on leaf tobacco in carloads from California and North Pacific ports to New York of $1.50 per hundredweight. The increased domestic rates which then became applicable were, from San Francisco, an all-rail commodity rate of $2.315 and from Tacoma the 4th class rate of $2.815. Early in 1919, however, an import rate of $1.875 was re-established which was equivalent to the former import rate of $1.50 increased by 25%. Much the same course was taken with reference to numerous other articles.

At present export and import rates are again in force, but in the case of the North Atlantic ports the carriers have been slower in returning to the old level of rates, and the Interstate Commerce Commission has even found it desirable to recommend lower rates on export grain via those ports. Since 1918 export and import rates have on the whole been made with less regard to encouraging or protecting American industry, and with more regard to equalizing the various groups of ports to the end that all might share in export and import traffic. This change is easily explained in view of the decreased competition from foreign manufacturers.

The chief factors affecting such rates have been the competition between various groups of ports—North and South Atlantic, Gulf, Pacific—which competition is backed by the several railways which serve the various groups of ports. A second factor is the competition among the several ports on each coast or among smaller groups of ports. Thus, not only do the Atlantic ports as a group compete with the Gulf ports for the export of grain, but there has been a long continued struggle to equalize the export grain rates among the several North Atlantic ports.

North Atlantic Ports.—*Import rail rates* from the North Atlantic ports have in the recent past been mostly confined to commodity rates. The Trunk Line carriers prior to 1918 made special proportional commodity tariffs on a list of about 50 commodities, applying chiefly to Central Freight Association Territory. These commodities include such as crockery, fullers' earth, kaolin, hemp and sisal, hides, bar iron, wood pulp, etc. These rates have been widely "blanketed," or, in other words, a single rate has been applied to the whole C. F. A. Territory or to several percentage groups within that territory.

The problem of establishing differentials to equalize the several North Atlantic ports with respect to import traffic has been partly solved by making rates from Philadelphia and Baltimore which, on classified freight, are lower than those from New York by the same differentials which have been allowed those ports on domestic traffic—2 cents and 3 cents respectively. Boston has long sought lower import rates than those from New York, contending that she should be able to meet Baltimore when the traffic moved on through import bills of lading, and that in the case of domestic bills of lading she should be able to meet the Canadian carriers. The Interstate Commerce Commission, however, has ruled that import freight rates from Boston should be the same as those from New York. Portland, Me., (via the Grand Trunk) and the eastern Canadian ports have special import rates to the Central West which are based on the rate from Baltimore.

The transcontinental movement of imports from Europe destined for the Pacific Coast via Atlantic ports has been favored by the Transcontinental railways and on such traffic these carriers have made special import rates equal to those which apply from "group C" points. This means a difference of as much as 20 cents per hundredweight, 1st class, as group C lies as far west as Michigan and Indiana. Such traffic, however, has not been large, since the greater volume of imports for Pacific Coast points comes in via Gulf ports or the Panama Canal.

Export rates via the Atlantic ports are more important than import rates, for they involve a larger volume of traffic. Competition among the Trunk Lines, and the competition which the Trunk Lines meet from the Canadian carriers, the water route via Montreal, and the carriers serving the Gulf ports, have been extremely keen; and this has tended to make export rates very low, especially on the great agricultural staples. Naturally these rates have applied from points west of Trunk Line Association Territory.

Even though export and domestic rates are not the same it is to be remembered that much export traffic moves to the seaboard on domestic bills of lading, and the domestic rates are held down by the export situation.

North Atlantic Port Differentials on Export Grain.— In view of the importance of export rate adjustments on grain traffic via the North Atlantic ports, it will be well to consider that subject rather fully at this point. The chief problem here is one of equalizing the ports. The City of New York has long claimed that ocean rates from Philadelphia and Baltimore are the same as those from New York and that the export rail rates from interior points should, therefore, be the same to all three cities. It is a part of this argument that any differential in ocean rates that may exist is due to the existence of inland differentials, and is made merely to equalize the through ocean-rail transportation charge. On their part, Philadelphia and Baltimore have contended that however the ocean rates may fluctuate, their ocean distance to Europe is much greater than that from New York and that, consequently, their costs of exporting, including insurance and the time factor, are greater. These ports contend that, as their ocean charges are higher than those from New York and Boston, their rail rates from western points should be correspondingly lower.

Another argument advanced by New York in favor of her contention has been that transportation to that city is cheaper than to Philadelphia and to Baltimore on account of the low grades of the New York Central and West Shore roads, to which the Pennsylvania and the Baltimore and Ohio lines have replied that they have counter advantages in the shape of cheaper fuel, as the coal they consume lies along their lines.

New York has urged that it has certain natural port advantages which it should be allowed to enjoy without giving arbitrary advantages to other ports. To this Baltimore and Philadelphia reply that while New York and Boston have advantages in the water route which, upon the same through rate, would attract traffic to those ports, these advantages should be equalized so that not the through rate but the sum total of all advantages of transportation through the several ports should be made equal. It is also claimed by the representatives of these ports that they can transfer and load grain more cheaply than it can be done in New York, for the reason that they do not have to use lighterage and that they have adopted more efficient labor-saving devices; and accordingly, they maintain that their freight rates, including the terminal charges, should be lower.

In most of these arguments New York and Boston have stood together in opposition to granting differentials to Philadelphia and Baltimore, but have split on the claims of Boston that on account of her less favorable location she should have certain special advantages for the purpose of enabling her to compete for export trade.

The Commission on Port Equalization.—As far back as 1905 the Interstate Commerce Commission stated the gist of the issue in the following words:

> The real question is on what basis shall rates be equalized through the various ports.
>
> New York and Boston insist that the through rates should be made the same in amount by all the ports. The through rate is made by adding together the inland rail rate from the interior to the port of export and the water rate from the port of export to the foreign destination. These localities contend that if the water rate from a given port, is higher, the rail rate to that port may be correspondingly lower, but only sufficiently lower to make the through rate the same.
>
> They further contend that water rates are in fact substantially the same from Baltimore and Philadelphia as from Boston and New York, and that, therefore, the inland rates to those ports should also be the same.
>
> Baltimore and Philadelphia urge that there are certain

> advantages at New York and Boston in the water route which upon the same through rate would attract traffic to those ports at their expense, and they urge that these advantages should also be equalized so that not the through rate but the advantages of transportation through the several ports shall be made equal.[4]

On the whole, the Interstate Commerce Commission has upheld the contentions of Philadelphia and Baltimore, and has lent its sanction to the long-established differentials under New York enjoyed by those ports.

In one respect, however, the Commission has in part upheld the contention of New York which refers to the effect of rail differentials on ocean rates, namely, the claim that ocean rates depend on the differentials made by the railways serving the ports and that if there is a lower differential there will be a proportionally greater ocean rate. This point appears in a decision of the Commission made in 1912 in the supplementary Chamber of Commerce of New York case:

> It appears that the steamship lines plying from Boston, Philadelphia, and Baltimore absorb or "get" as much of the differential inland rate as possible in their higher ocean rates . . . . and lines sailing from Baltimore and Philadelphia know that the inland rates are lower to and from those ports than to and from New York, that therefore they can get higher ocean rates at the out-ports. In other words, differentials to some extent operate as a bonus to the ocean carriers to bring traffic to and seek traffic at the ports where the lower inland rates apply.

The Commission has not upheld the claims of Boston for lower export rates. Boston, for example, has claimed that she should have a differential under New York on export traffic, for the reason that her terminal costs are lower, but the Commission ruled that even if this is true, Boston's advantage in this respect is offset by her long land haul.

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[4] 11 I. C. C. 65 (1905).

Relative Advantages of North Atlantic Ports.—Before inquiring in any further detail concerning the differential system established, let us consider the fundamental factors involved. If those factors are considered from a broad point of view, the whole matter may be summed up by comparing the relative advantages of the several ports. From such a point of view they include three aspects: (1) land transportation, (2) port facilities, (3) ocean transportation. The decisions of the Commission have been made in view of a consideration of all three of these points in combination, and the long-established system of differentials now in force is an attempt to equalize advantages with regard to the whole situation. It seems safe to say that the prevailing differentials are fairly just and are likely to persist for many years.

When, however, each point is taken up separately, it is difficult to weigh the relative advantages of the ports. As to *land transportation*, there is little doubt but that the cost per ton-mile of the New York Central is normally less than that of the Pennsylvania railway which serves Philadelphia, or the Baltimore and Ohio which serves Baltimore. It appears, however, that the distance from Chicago to Baltimore or Philadelphia is so much less than that to New York that those cities may fairly claim an advantage in freight rates. As a matter of fact, they enjoy differentials in domestic traffic which have resulted from competition. Boston, on a distance basis, should not even enjoy so low a railway rate as New York and the utmost concession is made when she is allowed the same rate as that which applies to New York.

As to *ocean transportation*, it is no doubt true that the ocean rate on full cargoes is virtually the same from Philadelphia and Baltimore as from New York. Certainly ocean rate differences are not so great as formerly and not only is Boston's advantage in this regard not so great as it once was, but in the case of low-grade traffic the disadvantage of Philadelphia and Baltimore is materially less than the amount of the railway differential. However, the ocean distance to Liverpool from Philadelphia and Baltimore is considerably greater than from New York, involving, perhaps, a voyage of from one to two days of greater length and accordingly a greater cost. The marine insurance charge appears to be slightly higher than from Philadelphia and Baltimore. Furthermore, the "berth rates" which apply on parcel loads, as distinguished from "cargo rates" which apply on full cargoes, are considerably higher from Philadelphia and Baltimore because of the smaller number of liners which sail from those ports. We may safely say, therefore, that New York and Boston have some slight advantage in ocean rates.

Terminal Facilities.—It is equally difficult to measure the relative advantages of the several ports regarded *as rail-ocean terminals or transfer points.* From this point of view, New York has the following advantages:

1. Certain advantages as a harbor:
    (a) Long water-front.
    (b) Larger harbor area permitting anchorage and manœuvering.
    (c) Island location which allows vessels to dock in the heart of the city.
2. More frequent sailings.
3. Faster and larger vessels.
4. Larger volume of passenger traffic which helps support steamship lines.
5. Greater storage capacity.
6. Superior banking facilities.
7. More highly developed option markets which facilitate hedging and dealing in futures.

In all these respects, but more particularly with regard to the first five points, New York has an advantage over all other ports in the United States.

On the other hand, New York has certain disadvantages as compared with Boston, Philadelphia, and Baltimore. Her terminal facilities are more often congested and there are many wasteful practices. These are partly due to the practice of the railways of giving free lighterage, which removes the inducement to steamship companies to seek the most economical pier space. It is claimed that the cost of handling grain by lighter in New York is appreciably greater than that of loading directly into the vessel, as is the practice in other ports. In 1917 the Interstate Commerce Commission found that about 40% of the export grain passing through New York was handled by lighter at a charge of .9 of a cent per bushel. Probably, it does not cost much more than .5 of a cent per bushel to handle grain by elevator direct to a ship's hold.

The difference in handling costs is not large considered as an absolute figure, but an advantage of even an eighth of a cent per bushel may determine the port by which grain will move for export. Probably the fact that the port of New York gets the larger share of high-class tonnage, is one result, as a small advantage in cost will more readily divert shipments of low-class freight to the out-ports.

Ex-Lake Grain.—Thus far we have been discussing the port differentials in so far as the traffic, chiefly grain and flour, is hauled all-rail to the ports. A very considerable volume of grain, however, moves by lake to Buffalo and to the Lake Erie points, thence by rail to the Atlantic ports. This "ex-lake" traffic offers a somewhat different problem in making differential adjustments between the several ports. A glance at the map (Fig. 32) shows that Buffalo is about equally distant from New York, Philadelphia, and Baltimore. Consequently, one of the chief factors in establishing the port differentials on export rail traffic does not apply on rail-lake shipments. This question was first taken up by the Interstate Commerce Commission in 1905, when, on ex-lake grain, Phila-

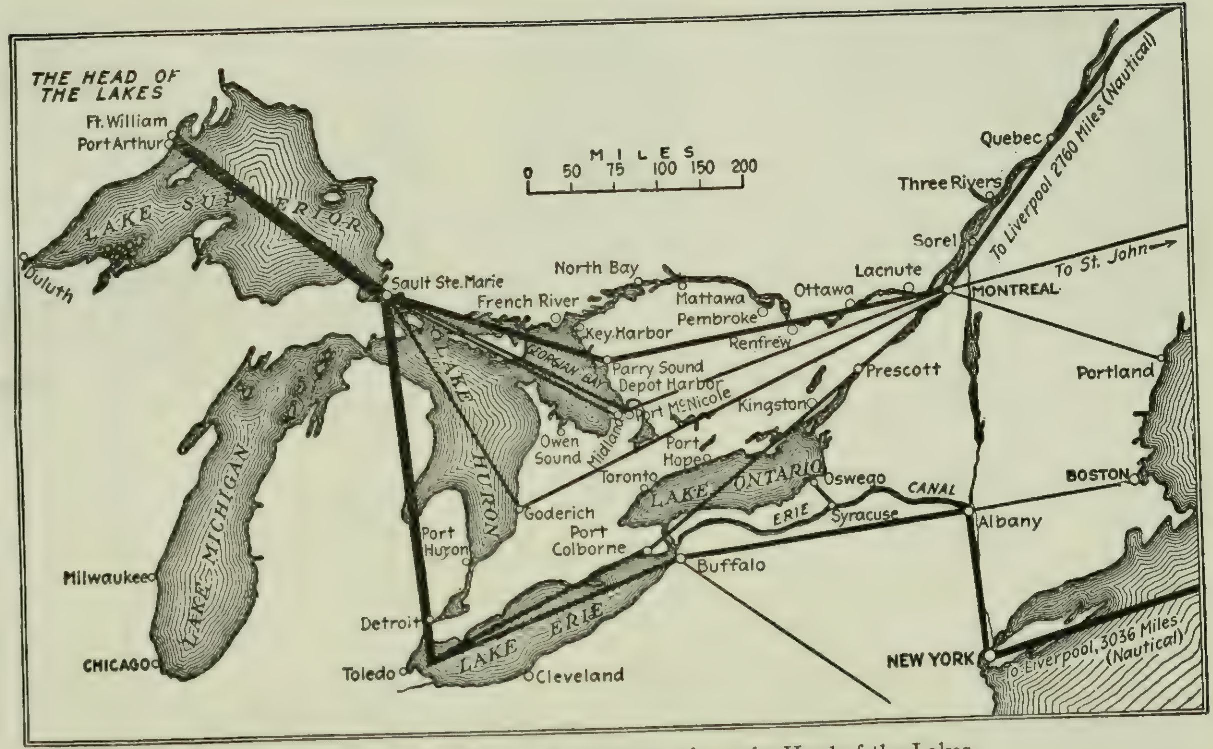


Fig. 32.—Canadian Ports—Grain Routes from the Head of the Lakes

delphia and Baltimore were both allowed a differential on wheat of .3 of a cent per bushel under the New York rate. Earlier cases had mentioned the problem, but it had apparently been assumed that as the origin of the ex-lake was the same as that of the all-rail shipments, the same differentials would apply, an assumption which is obviously illogical, since it may be cheaper to ship by lake to Buffalo and thence to New York than it is to ship all-rail to Baltimore. Once the grain is at the Lake Erie point, Baltimore has no advantage over New York, even in distance. In fact, the sole ground for differentials on ex-lake grain is the advantage which New York has in ocean transportation. On this ground, therefore, the Commission ruled that .3 of a cent per bushel should be sufficient to equalize Philadelphia and Baltimore with New York, or in other words, to make shipments via all three ports equally attractive.

Low Export Rates—Port Differentials on Export Traffic.—We are now in a position to understand the reason, not only for the relative low rates made on export and import traffic via the North Atlantic ports, but also for the port differentials on export and import traffic which make the rates via Baltimore and Philadelphia less than those of New York and Boston. As illustrating the relation between domestic and export rates, the following statement is presented, showing both the all-rail and ex-lake rates on wheat from Chicago and Buffalo and the export railway rates on structural steel from Pittsburgh.

This table shows that the export rates are often 25% or more lower than the domestic rates, and indicates how the railways assist American industries in competing for the world's markets.

Merely to illustrate the difference between import and domestic rates, it is interesting to note that the domestic rate

Export Rates on Wheat

		Boston	
		Domestic	Export
Wheat rates (per 100 lbs.)	All-rail, Chicago to North Atlantic ports	32¢	22½¢
	Ex-lake, Buffalo to North Atlantic ports	23.17¢	15.17¢
Structural steel rates	All-rail, Pittsburgh to North Atlantic ports	36½¢	25½¢

* Reshipped at Chicago. Proportional rates; chief use is for scaling intermediate

on straw braid from Pacific Coast ports to Chicago in 1918 was $4.25 a hundred, while at the same time the import commodity rate was $1.75. Also the domestic all-rail commodity rate on leaf tobacco from San Francisco to New York was $2.315, while the import commodity rate was $1.50.

Port Differentials.—These differentials vary according to the commodity. On export grain, all-rail, Boston takes the same rate as New York, while the Philadelphia rate is 1 cent under New York and the Baltimore rate is 1.5 cents under that via New York. On export flour the differential enjoyed by Baltimore is somewhat greater, being 2 cents per 100 pounds under New York. The Boston and Philadelphia rates bear the same relation to New York as in the case of grain. On export grain products, other than flour, the differentials are 2 cents and 3 cents respectively—the same as the domestic differentials. Other cases are shown in the foregoing table; and, as already stated, the ex-lake differentials on wheat are .3 of a cent *per bushel.*

South Atlantic Ports.—*Import rates* from South Atlantic ports to the Central West are more narrowly defined as to points of origin and apply to fewer points of destination than is the case with other groups. The rates from this group tend to equal that from Baltimore. The *export rates* are made with

AND `STRUCTURAL STEEL

NEW YORK		PHILADELPHIA		BALTIMORE	
Domestic	Export	Domestic	Export	Domestic	Export
30¢* 20.07¢	22½¢ 15 17¢	28¢ 20.07¢	21½¢ 14.07¢	27¢ 20.07¢	21¢ 14.07¢
34¢	25½¢	32¢	23½¢	31¢	22½¢

points on Chicago-New York basis.

the purpose of equalizing these ports with the North Atlantic group. They generally differ according as the traffic originates at the Ohio River Crossings or in C. F. A. Territory; if the former, the rates are based on Baltimore, while from C. F. A. Territory they are approximately the same as to New York. This is especially true of export class rates. Wilmington, N. C., appears to be less advantageously situated as to export rates than the other South Atlantic ports.

Gulf Ports.—More and more of late the Gulf ports have gained in importance as centers for export and import traffic, and their increasing rivalry has led the Atlantic ports to demand a reduction in differentials allowed to the Gulf ports on such traffic.

The chief factors which affect the export and import rates via the Gulf ports are: (1) the relatively high ocean rates from these ports, and (2) the unbalanced character of the traffic of the carriers which serve them. Ocean freight rates to the British Isles from the Gulf ports in January, 1921, were quoted at about 5 cents per cubic foot or 15 cents per 100 pounds above those from the North Atlantic ports. Such differences naturally require considerable railway differentials if these ports are to be equalized. The bulk of the railway traffic of the Gulf carriers is south bound, which makes possible low railway rates on export traffic, but more especially results in a tendency to make reductions on import traffic in order to help fill their cars and prevent an empty back haul.

Prior to 1907 no great volume of exports or imports moved via the Gulf ports. The Atlantic ports are nearer the great interior producing and consuming territory, and, above all, their ocean shipping facilities were much more highly developed than those of the South. Only about 20% of our exports used to move out via the Gulf, and but 5% of our imports came in that way.

About 1907 the import rate situation at the Gulf ports came to a head, and especially it appeared that steamships could not serve those ports adequately unless they were to bring in import cargoes as well as carry away exports. At the same time, as just noted, the railways badly needed traffic to fill their empty northbound cars. Accordingly, differentials based on the New York rate were established for import traffic from Europe and Africa to middlewestern points, which differentials ranged from 18 cents under the New York rate on 1st class traffic down to 6 cents on 6th class, and 6 cents on commodity rates. On traffic from Asia, Australia, New Zealand, and the Philippines, however, import rates were the same as those from New York; and from other countries the rates were mostly based on Baltimore. For import rates from the Gulf, the central western points were blanketed, and the rates were made equal from all Gulf ports, except that Key West was charged a differential over the others.

A number of special import commodity rates apply from Gulf ports to southern interior points—on fertilizer materials, asphalt, gum chicle, manganese ore, sugar, etc. Such rates usually equalize the various ports and are often constructed by taking the lowest domestic rate in effect from any port and applying it to all the others.

An important part of the import traffic via Gulf ports moves to the Pacific Coast, and the Transcontinental lines (especially the Southern Pacific) have maintained westbound proportional tariffs on imports covering a long list of commodities, naming rates considerably lower than the domestic rates.

Export Rates via Gulf Ports.—From central western points to the Gulf ports both class and commodity *export rates* have been established. From C. F. A. Territory these rates are generally the same as to New York or to Baltimore, while from points west of the Mississippi it has been more common to equalize the Gulf ports by applying to all of them, from Pensacola to Galveston, the rate in existence to some pivotal point such as New Orleans.

On export grain from the Illinois group of middlewestern points to Gulf ports there has been a 6 cent differential under Baltimore. This differential was somewhat reduced by a rate cut made by the Eastern lines to Baltimore in September, 1921, but the Illinois Central and other lines extended to the Gulf have sought to make reductions which will restore the old differentials and secure for them a larger share of the traffic.

In 1921, the export rate on agricultural implements from Chicago to New Orleans and Galveston was 39 cents per hundred pounds, as compared with 45 cents to New York; thus the 6 cent differential, so common on import traffic via Gulf ports, was also applied on exports. Special export rates are also made on petroleum and its products, and there are many special rates on traffic for Cuba via Key West and Tampa.

When the general percentage rate advances were made in 1920, the northern rates were put up 40%, while those in the South were raised 33⅓%. This had the effect of making southern import and export rates relatively lower than such rates to north Atlantic ports, and the subsequent flat 10% reduction left the southern ports, both South Atlantic and Gulf, still in possession of their advantage.

Pacific Coast Ports.—From the Pacific Coast ports all the carriers serving points from Vancouver on the north to the port of Los Angeles on the south have joined in making an "eastbound proportional tariff" which applies from points in Asia, the Philippines, Australia, and beyond, to all points in the territory east of the Rocky Mountains. This tariff covers most of the products ordinarily imported from the Orient, including bamboo ware, china, earthen ware, matting, rugs, skins, silk, tea, gums, and fibers.

The special *import commodity rates* so provided serve to equalize the Pacific ports and to establish an adjustment with reference to Atlantic and Gulf ports. There are no fixed differentials but the import rates from the Pacific to Chicago only exceed those from New York by an amount which approximately balances the advantage of the Pacific ports in ocean freight rates from the Orient.

Originally import rates from the coast "blanketed" all points east of the Rockies, but recently a part of these rates have been readjusted so as to divide the eastern territory into two groups, one including Chicago and points west, the other all territory east of Chicago.

Low *export tariffs*, were in force for a good many years via Pacific ports but were concealed under the guise of through rail-and-ocean rates. Because of the passage in 1906 of the Hepburn Act, which required the filing and publication of all tariffs and the lapse of a certain time between publication and the actual application of railway rates, these rates were withdrawn except via Canadian roads and Vancouver. Export rates are (1) so low, and (2) so unstable and fluctuating, that the carriers did not deem it expedient to publish them. Even when the Interstate Commerce Commission reduced the time required for giving notice before making a change in rates to that indicated on a preceding page, the relief was not deemed sufficient.

For some years now, however, the Transcontinental carriers have maintained special export commodity rates to certain points in Japan, China, the Philippines, India, Australia, and New Zealand. These rates apply from all eastern territory, and are equal via all the Pacific ports. They serve roughly to equalize those ports with Atlantic and Gulf ports on traffic to the Orient, and are considerably lower than Transcontinental rates on domestic traffic. Traffic for export via Pacific ports, which is not covered by these special commodity rates, must move to the coast on the domestic rates in force to San Francisco or Seattle, but, when the goods are consigned to points in Asia, Australia, and New Zealand, or the Philippines, such rates cover terminal switching and unloading charges.

The Merchant Marine Act and Export Rates.—It remains to note one provision of the Merchant Marine Act of 1920 which has an important potential bearing on export traffic. Section 28 of that Act provides that property may not be transported by any common carrier subject to the Interstate Commerce Commission under a joint rate or under export or import or other proportional rates which are lower than the rate charged for like property for the same distance and direction in connection with domestic commerce, unless such property is carried in a vessel documented under the laws of the United States. That is to say, reduced export and import rates are prohibited unless the traffic involved is to be carried in United States vessels. Obviously, the object is to encourage the American merchant marine.

This provision of the Act, however, has not been made effective, for there is a proviso to the effect that the United States Shipping Board may certify to the Interstate Commerce Commission that the vessels documented under the laws of the United States are inadequate, when the Interstate Commerce Commission may suspend the foregoing requirement. Under this proviso the operation of the section has been suspended down to the present time, and it is not probable that it will ever be applied. For one thing, foreign governments have protested and their reprisals would doubtless follow the enforcement of the provision. Furthermore, the commercial interests on the Pacific Coast have opposed the measure, as vessels documented under the laws of this country are not adequate at those ports and cannot, it is claimed, economically operate therefrom.

Summary.—In general, we may say that New York is the great pivotal port. On traffic to or from central western points, the tendency has been to equalize commodity rates via South Atlantic ports and Gulf ports with the port of New York, by basing them directly on that port or on Baltimore. On most commodities from the Central West, Boston and New York have the same rate, Philadelphia gets 2 cents under New York; Baltimore and Norfolk, 3 cents under New York; Savannah and Jacksonville have the same rate as New York; New Orleans and Galveston have a 6 cent differential. All the Gulf ports, from Pensacola to Galveston inclusive take the same rates. Rates to and from the Pacific Coast are largely blanketed, and, without any fixed differentials, serve to equalize traffic via the Pacific ports with that moving via Atlantic and Gulf ports. A large part of export and import traffic, however, moves to the ports on domestic rates, especially in the case of the Atlantic ports, and today the chief problem is that of port equalization rather than that of enabling American industry to compete abroad.

Part V—Freight Traffic Arrangements

CHAPTER XXVI

THE SHIPPING OF FREIGHT

Nature and Importance of Shipping Process.—The chief point of contact between shipper and carrier lies in the steps which attend the delivery of freight by the former into the possession of the latter or the receipt of freight by the consignee. Aside from the trucking of freight by the shippers to or from the freight-house, the chief matters to be discussed in this connection are the packing, marking, weighing, and loading of the freight, concerning each of which operations the carriers have established important rules. In addition, it is desirable to describe briefly the shipping papers which are made out and which largely govern the rights and obligations of the parties interested. The chief value of this chapter may lie in its practical importance as a description of trade practices, but it is hoped it may also be worth while, from a broader point of view, to point out the economic significance of the matters described.

I. Handling Freight at Terminals, and the Shipping Papers

C. L. and L. C. L. Shipments.—Freight may be delivered to the railway either as less-than-carload (L. C. L.) shipments or as carload (C. L.) shipments. L. C. L. freight must generally be delivered by the shipper to the carrier's outbound freight-house, where it is weighed and put into the proper car for transportation.

Much the greater part of a railway's tonnage, however, consists of carload freight, and is loaded directly into cars by the shipper, the cars being delivered or "spotted" by the carriers at the shipper's request on his industrial siding, or on the public team tracks at the railway terminal. Such a request is usually made of the freight agent, who sends it to the car distributor. The car is hauled by a switching locomotive to the freight yard where, along with other cars, it is "classified" according to destination points and made up into trains.

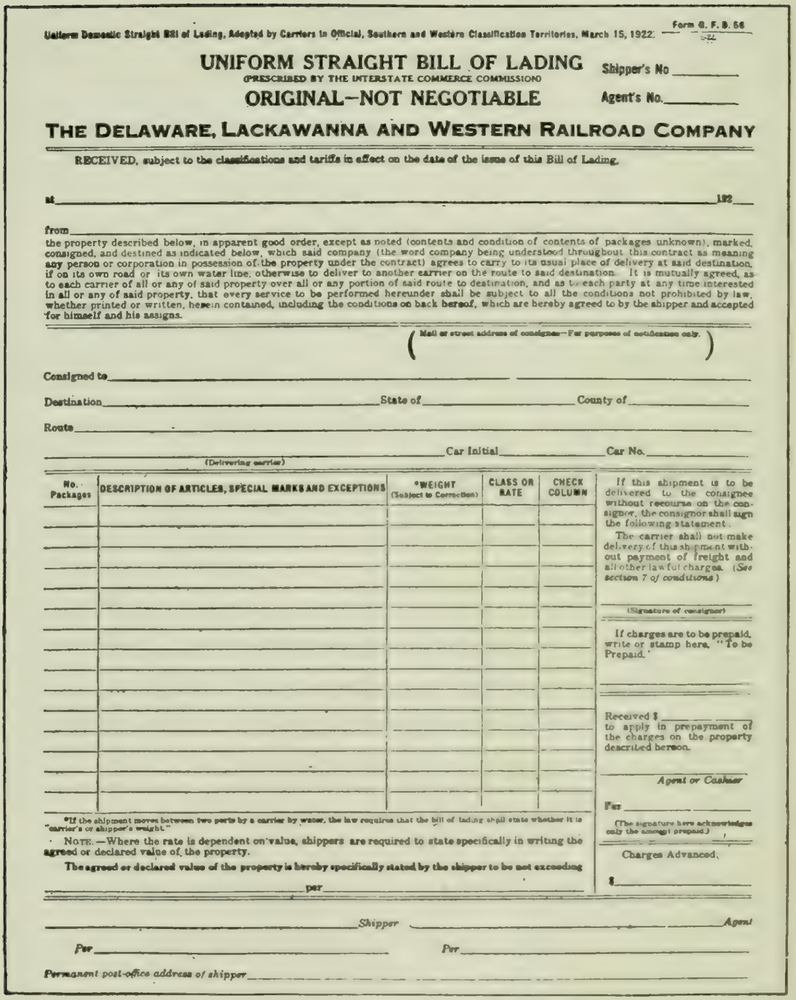
At the destination the reverse process is gone through, the car containing various L. C. L. shipments then being switched to the inbound freight-house, where its contents are checked and unloaded by the carrier and the several consignees given notice of the arrival of their shipments. Carload shipments are delivered on industrial siding or team track and unloaded by the consignee.

Handling Freight at Shipping Point.—A brief description of the method of handling outbound L. C. L. shipments is as follows: The truck containing numerous packages from some wholesaler is backed up to one of the doors of the freight-house. Here the "caller" takes the shipment from the truck driver, puts it on a warehouse truck, weighs it, and calls off the name of the consignee, the destination, and the weight. Meanwhile, the "receiving clerk" checks the driver's shipping ticket and makes out a receipt for the goods. If the ticket is correct, the various packages or articles are tagged or marked to indicate the car in which they are to be placed. Next, the "trucker" takes the shipment to the particular car which is to be hauled to the destination to which the shipment is billed, the car being marked to indicate the track on which it is to go and its position in the train which will be made up on that track. In the car, there is a "stower," who, after examining the freight to see if it is in good condition, receives and loads it in the order of stations along the line as nearly as possible, putting the first shipments to be unloaded near the car door.

The handling of carload shipments is much simpler from the railway's point of view. The car ordered by the shipper is switched and "spotted" on the shipper's siding, or on some public team track, where the loading is attended to by the shipper.

Bills of Lading—Straight Bill.—In order to keep track of these operations and to define the responsibility of both parties to the shipment, a number of different documents are executed which taken together may be called the shipping papers. On delivery of freight to a railway a "bill of lading" is issued. This document may be thought of as having three functions: It is a shipping order, a receipt for freight, and a contract between shipper and carrier covering the transportation service. Indeed, some carriers issue a separate "receipt for freight." The uniform bill of lading which is prescribed by the Interstate Commerce Commission is made in triplicate, the "original" copy being sent to the consignee, the "shipping order" copy being retained by the carrier, and the "memorandum" copy being retained by the shipper. A form of the original bill is shown in Fig. 33.

A glance at the bill of lading shows that it is, in the first place, an acknowledgment by the carrier of the receipt of certain articles which are described in the bill. In the second place, the carrier contracts to deliver the freight at a destination point and to a consignee as specified in the bill, and the liability of the carrier for damages to the freight in transit are set forth. The class or rate applying to the shipment is specified, and if the rate is dependent on the value of the goods, as



Uniform Domestic Straight Bill of Lading, Adopted by Carriers in Official, Southern and Western Classification Territories, March 15, 1922. Form G. F. B. 66

UNIFORM STRAIGHT BILL OF LADING
(PRESCRIBED BY THE INTERSTATE COMMERCE COMMISSION)
ORIGINAL—NOT NEGOTIABLE

Shipper's No ________
Agent's No. ________

THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading,

at ________ 192__

from ________

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own road or its own water line, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, herein contained, including the conditions on back hereof, which are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address of consignee—For purposes of notification only.)

Consigned to ________

Destination ________ State of ________ County of ________

Route ________

________ Car Initial ________ Car No. ________
(Delivering carrier)

No. Packages	DESCRIPTION OF ARTICLES, SPECIAL MARKS AND EXCEPTIONS	*WEIGHT (Subject to Correction)	CLASS OR RATE	CHECK COLUMN

If this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges. (*See section 7 of conditions.*)

____
(Signature of consignor)

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ ________ to apply in prepayment of the charges on the property described hereon.

____
Agent or Cashier

Per ________

(The signature here acknowledges only the amount prepaid.)

Charges Advanced,

$ ________

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."

NOTE.—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.

The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

________ per ________

________ *Shipper* ________ *Agent*

Per ________ *Per* ________

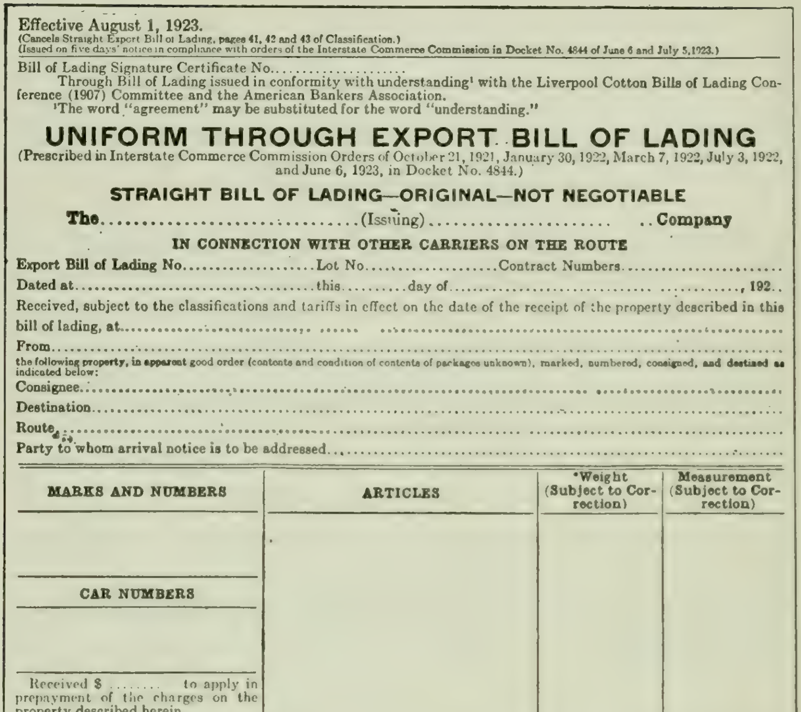
Permanent post-office address of shipper ________

Fig. 33.—Uniform Straight Bill of Lading

is sometimes the case, the agreed or declared value of the property is entered on the bill. In the case of carload freight, the record of the shipment, the car initials, and car number are shown, the last two items being entered on the bill of lading when the shipment is loaded.

Order Bill of Lading.—There are two great classes of bills of lading, the "straight" bill of lading and the "order" bill of lading. The first of these classes has just been described, and it will be observed that the illustration is that of a uniform "straight" bill of lading. The essential difference between the two is that the straight bill is not negotiable, and its surrender by the consignee is not required upon delivery of the shipment except when necessary for the purpose of identification. An order bill of lading, however, is to a considerable extent a negotiable instrument, and the surrender of the original order bill of lading, endorsed by the shipper, is required by the carrier upon the delivery of the freight. With the exception of this requirement and the fact that in the order bill the shipment is consigned to the *order of* the shipper or some person at destination point, the two forms of bills are the same.

The order bill of lading is used when a shipper desires to collect for his shipment before it is delivered to the consignee. Instead of sending the original bill of lading to the consignee, the original order bill is sent through some bank accompanied by a draft drawn on the consignee. The consignee secures possession of the bill of lading by paying the draft and can then claim the shipment covered by the bill by presenting it to the carrier's agent at the destination point. It is the common practice for a shipper, in using the order bill of lading, to consign the shipment to himself, designating the real consignee as the person to be notified of its arrival at destination. The shipment is thus deliverable only upon the shipper's order.



Effective August 1, 1923.
(Cancels Straight Export Bill of Lading, pages 41, 42 and 43 of Classification.)
(Issued on five days' notice in compliance with orders of the Interstate Commerce Commission in Docket No. 4844 of June 6 and July 5, 1923.)

Bill of Lading Signature Certificate No....................

Through Bill of Lading issued in conformity with understanding[1] with the Liverpool Cotton Bills of Lading Conference (1907) Committee and the American Bankers Association.

[1]The word "agreement" may be substituted for the word "understanding."

UNIFORM THROUGH EXPORT BILL OF LADING

(Prescribed in Interstate Commerce Commission Orders of October 21, 1921, January 30, 1922, March 7, 1922, July 3, 1922, and June 6, 1923, in Docket No. 4844.)

STRAIGHT BILL OF LADING—ORIGINAL—NOT NEGOTIABLE

The..............................(Issuing)........................ ..**Company**

IN CONNECTION WITH OTHER CARRIERS ON THE ROUTE

Export Bill of Lading No....................Lot No....................Contract Numbers........................

Dated at..................................this..........day of..................................., 192..

Received, subject to the classifications and tariffs in effect on the date of the receipt of the property described in this bill of lading, at...

From...

the following property, in apparent good order (contents and condition of contents of packages unknown), marked, numbered, consigned, and destined as indicated below:

Consignee...

Destination...

Route..

Party to whom arrival notice is to be addressed...

MARKS AND NUMBERS	ARTICLES	*Weight (Subject to Correction)	Measurement (Subject to Correction)
CAR NUMBERS			
Received $ .... to apply in prepayment of the charges on the property described herein. .... Agent. By .... (The signature here only acknowledges the amount prepaid.)	*U. S. Law requires Agent issuing Bill of Lading to write either "Shipper's" or "Carrier's" before "Weight."		

To be carried to the port (A) of.............................. and thence by ....

to the port (B) .... (or so near thereto as vessel may safely get), and to be there delivered in like good order and condition as above consigned, or to consignee's assigns, or to another carrier on the route to destination if consigned beyond said port (B), upon payment immediately on discharge of the property of the freight thereon, at the rate

(INLAND AND/OR COASTWISE) from .... to .... of .... cents

per one hundred pounds gross weight, port charges, if any.................. cents, and (OCEAN AND ON-CARRYING) from......................

to.................. of .... cents, per ...., and advanced charges .... ($ ....), with

all other charges and average, without any allowance of credit or discount, ..., settlement to be made on the basis of United States gold currency, amount to be paid by receivers at current rate of New York exchange as quoted on the day the vessel is entered at the Custom House at her port of discharge.

In consideration of the rate of freight herein named it is hereby stipulated that the service to be performed hereunder shall be subject to the contract terms and conditions, whether printed or written, herein contained, and said terms and conditions are hereby agreed to by the shipper and by him accepted for himself and his assigns.

CONTRACT TERMS AND CONDITIONS.

Any alteration, addition, or erasure in this bill of lading which shall be made without the special notation hereon of the agent of the carrier issuing this bill of lading shall be without effect and this bill of lading shall be enforceable according to its original tenor. If shipment consists of cotton or cotton linters it is mutually understood and agreed that the description of the condition does not relate to insufficiency of or the torn condition of the covering, or to any damage resulting therefrom, and that no carrier shall be responsible for any damage of such nature. The vessel shall be at liberty to call at any port or ports in or out of the customary route, to tow and be towed, to transfer, trans-ship, or lighter, to load and discharge goods at any time, to assist vessels in distress, to deviate for the purpose of saving life or property, and for docking and repairs.

This bill of lading is not to be used on traffic from a point in the United States destined to an adjacent foreign country.

IN WITNESS WHEREOF, the agent signing on behalf of the said The......(Issuing) .....Company and of the said Ocean Carrier or Ocean Vessel and her owner, severally and not jointly, hath affirmed to............Bills of Lading, all of this tenor and date, one of which Bills being accomplished, the others to stand void.

.... Shipper.

By.. .... Agent.
On behalf of carriers severally but not jointly.

Fig. 34.—Rail and Ocean Export Bill of Lading

For this reason, order bills are commonly referred to as "order-notify" bills of lading.

Export Bill of Lading.—Special forms of bills of lading exist, of which the chief ones are the "rail-and-ocean export bill of lading," and the "uniform livestock contract." Grain also often moves on a special bill of lading. One form of export bill of lading is shown in Fig 34. Such a bill is used when it is desired to make a shipment through to some foreign port or inland destination. Its use makes it unnecessary for the shipper to attend to the details of transferring the freight from the railway terminal to the pier and of clearing it through the ports.

An examination of the export bill of lading shows that it covers three operations: *first*, the shipment is to be carried to the port by rail; *second*, it is to be shipped to the foreign port by water; and *third*, it may be consigned at the foreign port to another carrier if the destination lies beyond that port. With reference to this third part of the contract, it is specified on the back of the bill of lading that "the property shall be subject exclusively to all conditions of the carrier or carriers completing the transfer; the duty of notification above provided for shall fall exclusively within the obligation of the carrier completing the transfer, and no prior carrier shall be responsible for the fulfillment of that obligation." In reality, each one of the three parts referred to constitutes a separate contract, and the initial carrier which issues the export bill of lading is not responsible for losses and damages which occur after the shipment has been delivered to the vessel.

Livestock Bills.—A copy of the uniform livestock contract is given in Fig. 35. The chief peculiarity of this bill of lading is that it distinguishes between "ordinary livestock" and "other than ordinary livestock," the shipper being required to execute

Form G. F. 1
2-22

Uniform Live Stock Contract Adopted by Carriers in Official, Southern and Western Classification Territories; Effective March 15, 1922

UNIFORM LIVE STOCK CONTRACT

(PRESCRIBED BY THE INTERSTATE COMMERCE COMMISSION)

This form of contract to be used for shipments of Live Stock and Wild Animals instead of Uniform Bill of Lading

DUPLICATE ORIGINAL—NOT NEGOTIABLE

THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

..................................Station, ..., 192...

THIS AGREEMENT, made this..................day of..................................., 192.., by and between the

THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

party of the first part, hereinafter called the carrier,* and..

....(Shipper's name)

part .... of the second part, hereinafter called the shipper;

WHEREAS, The classifications and tariffs under which this agreement is made require that, for the purpose of applying the lawful rate of freight, the shipper must declare the shipment to be "Ordinary Live Stock," specifying the kind or kinds of animals, or if not "Ordinary Live Stock" he must declare the kind and value of each animal, space for such declaration being provided below:

NOW, THEREFORE, THIS AGREEMENT WITNESSETH, That the carrier has received from the shipper, subject to the classifications and tariffs in effect on the date of issue of this agreement, the live stock described below, in apparent good order, except as noted, consigned and destined as indicated below, which the carrier agrees to carry to its usual place of delivery at said destination, if on its road or on its own water line, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier* of all or any of said live stock over all or any portion of said route to destination, and as to each party at any time interested in all or any of said live stock, that every service to be performed and every liability incurred in connection with said shipment shall be subject to all the conditions, whether printed or written, herein contained, including the conditions on back hereof, and which are agreed to by the shipper and accepted for himself and his assigns.

Consigned to...

Destination..............................., State of..........................., County of..............................

Route..

Car Initials and Numbers..

ORDINARY LIVE STOCK.

Ordinary live stock means all cattle, swine, sheep, goats, horses and mules, except such as are chiefly valuable for breeding, racing, show purposes, or other special uses. On shipments of ordinary live stock no declaration of value shall be made by the shipper, nor shall any values be entered on this bill of lading.

OTHER THAN ORDINARY LIVE STOCK.

On shipments of live stock chiefly valuable for breeding, racing, show purposes, or other special uses different rates of freight are in effect dependent on the valuation placed thereon by the shipper; which valuation may be the basic value as stated in the classification, at which the lowest freight rate applies, or it may be any higher valuation up to actual value, in which event the freight rate will be higher by the amount prescribed in the tariffs or classifications. Such declared or agreed values shall be entered in the column provided therefor in this bill of lading, and in no event shall the carrier be liable for any amount in excess of such valuation.

I (We) declare the shipment covered by this bill of lading to be ordinary live stock.

....
Shipper.

I (We) declare the shipment covered by this bill of lading to be other than ordinary live stock, and of the value herein declared, or agreed upon, and entered.

....
Shipper.

Note.—**The shipper shall execute one of the above declarations. Upon refusal of a shipper of other than ordinary live stock to declare the** values of said stock for entry in this bill of lading the shipment will not be accepted for transportation under this contract. In the event the shipment consists of both ordinary live stock and other than ordinary live stock, both of such declarations shall be executed, but values shall be declared and entered on only the other than ordinary live stock.

NUMBER AND DESCRIPTION OF ANIMALS	SHIPPER'S DECLARED VALUE (If on live stock chiefly valuable for breeding, racing, show purposes, or other special uses)	WEIGHT (Subject to correction)	RATE OF FREIGHT	
			Per 100 pounds	Per car

If this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: **Delivery shall not be made of this shipment without payment of freight and all other lawful charges.** (See section 3 of Conditions.)

....
Signature of Consignor.

If charges are to be prepaid, write or stamp here, "To be prepaid."

....

Acknowledgment to be used if freight is prepaid.

Received $......................, to apply in prepayment of the charges on the live stock described hereon.

....
Agent or Cashier.

Per.......................................
(The signature here acknowledges only the amount prepaid)

Charges advanced, $......................

Witness my hand: ...., *Shipper.*

By.................................., *Shipper's Agent.*

....

.................................., *Witness.*

The Delaware, Lackawanna and Western Railroad Company

By.................................., *Agent.*

---

* The word "carrier" is to be understood throughout this contract as including any person or corporation in possession of the live stock under the contract.

Fig. 35.—Livestock Bill of Lading

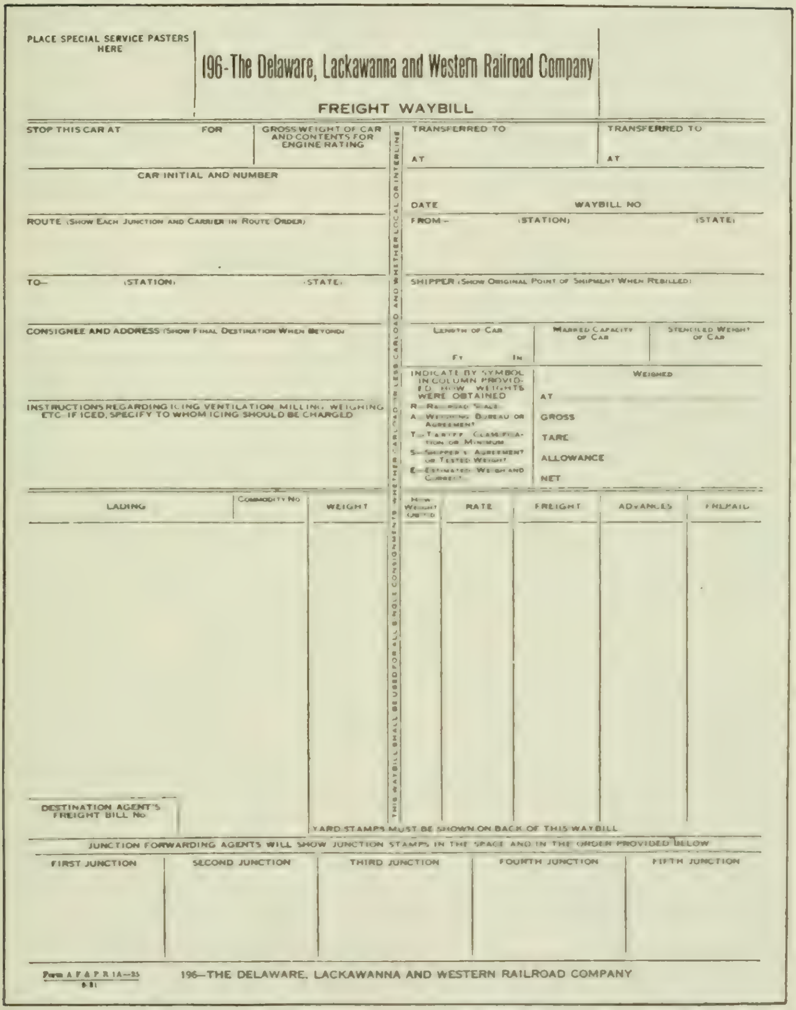
a declaration specifying which kind of livestock is contained in the shipment. The reason for this distinction is that the Interstate Commerce law requires that rates on ordinary livestock must not be made dependent upon value, while livestock which is chiefly valuable for breeding, racing, show purposes, or other special uses, may be charged rates which vary with the value of the animal.

Other Papers—Waybill.—When a car of L. C. L. freight arrives at destination, it is opened and its contents are checked with the waybill—which is described in a following paragraph. Arrival notice is sent to the consignee, generally in the form of a postcard. When the freight is claimed, the carrier submits a "freight bill" in duplicate, one copy being retained by the consignee, which serves as a "receipt for freight."

Other than the waybill, the papers mentioned have been those which concern the relationship between shipper and carrier. The waybill, a very important document, is made out by the railway for the purpose of keeping track of the shipments while in transit. It is made up at the point of origin by a billing clerk, the entries thereon being taken from the bills of lading. Usually a separate waybill is made for each shipment, but all shipments in a car consigned to a single destination may be entered on one waybill. One form is that shown in Fig. 36.

One copy of the waybill is kept on file by the agent at the shipping point, and another is sent to the auditor of freight accounts, but the original either accompanies the shipment or is mailed to the agent at the point of destination. In case the waybill does not accompany the shipment, a special "card waybill" is made out, which contains the data required by the freight-train conductor and space for entries to be made by him.

The waybill shown in the illustration may be used for both



PLACE SPECIAL SERVICE PASTERS HERE

196-The Delaware, Lackawanna and Western Railroad Company

FREIGHT WAYBILL

STOP THIS CAR AT FOR

GROSS WEIGHT OF CAR AND CONTENTS FOR ENGINE RATING

TRANSFERRED TO

AT

TRANSFERRED TO

AT

CAR INITIAL AND NUMBER

DATE

WAYBILL NO

ROUTE (SHOW EACH JUNCTION AND CARRIER IN ROUTE ORDER)

FROM— (STATION) (STATE)

TO— (STATION) (STATE)

SHIPPER (SHOW ORIGINAL POINT OF SHIPMENT WHEN REBILLED)

CONSIGNEE AND ADDRESS (SHOW FINAL DESTINATION WHEN BEYOND)

LENGTH OF CAR	MARKED CAPACITY OF CAR	STENCILED WEIGHT OF CAR
FT IN		

INSTRUCTIONS REGARDING ICING VENTILATION MILLING WEIGHING ETC IF ICED, SPECIFY TO WHOM ICING SHOULD BE CHARGED

INDICATE BY SYMBOL IN COLUMN PROVIDED HOW WEIGHTS WERE OBTAINED

R—RAILROAD SCALE

A—WEIGHING BUREAU OR AGREEMENT

T—TARIFF CLASSIFICATION OR MINIMUM

S—SHIPPER'S AGREEMENT OR TESTED WEIGHT

E—ESTIMATED WEIGH AND CORRECT

WEIGHED

AT

GROSS

TARE

ALLOWANCE

NET

THIS WAYBILL SHALL BE USED FOR ALL SINGLE CONSIGNMENTS WHETHER CARLOAD OR LESS CARLOAD AND WHETHER LOCAL OR INTERLINE

LADING	COMMODITY NO	WEIGHT	HOW WEIGHT OBT'D	RATE	FREIGHT	ADVANCES	PREPAID

DESTINATION AGENT'S FREIGHT BILL No

YARD STAMPS MUST BE SHOWN ON BACK OF THIS WAYBILL

JUNCTION FORWARDING AGENTS WILL SHOW JUNCTION STAMPS IN THE SPACE AND IN THE ORDER PROVIDED BELOW

FIRST JUNCTION	SECOND JUNCTION	THIRD JUNCTION	FOURTH JUNCTION	FIFTH JUNCTION

Form A F & P R 1A—25
8-31

196—THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY

Fig. 36.—Waybill

local and interline shipments and for all kinds of commodities. It is often the practice, however, to use a form of waybill for interline shipments which is different from that for local shipments; and special waybills are used by some lines for various commodities.

When errors are discovered in the waybill, "waybill correction notices" are sent out, which state how the waybill reads and how it should read.

2. The Packing of Freight

Importance of Good Packing.—One of the chief causes of loss and damage and of claims therefor is the inadequacy of packages and containers which are used by shippers. It has been said that in the handling of perishables by rail the losses by reason of frail containers and improper packing in one year amounted to $100,000,000, and in another to $150,000,000. This is a serious matter and one which calls for a consideration in the interest of both shipper and carrier, to say nothing of the social aspect. Such losses demand the cooperation of shippers, carriers, and manufacturers of containers.

The trouble lies partly in the weakness of the materials used in constructing containers, and partly in the faulty method of construction. Of late years this trouble has increased for two reasons: *first,* materials have increased in cost with the result that there has been a tendency to practice a shortsighted economy in their use; and *second,* there has been increased strain in transportation due to growing density of traffic and length of haul. Both cars and trains are more heavily loaded than formerly, and trains are moved more rapidly, both of which developments result in subjecting containers to greatly increased stresses and strains. The longer hauls which have come with the widening of markets involve more transfers with the attendant breakage.

Proper packing is a kind of insurance against delay and injury to freight, and the additional expense required to reduce the risks of loss and damage is not only socially desirable but is good business. The arrival of freight in good condition brings the shipper increased goodwill, while loss and damage to shipments will make the consignee dissatisfied. The carrier is entitled to proper packing, and in any event the wise shipper will find the carriers more apt to cooperate with him if his goods are always well packed.

Carriers' Rules on Packing.—The Consolidated Classification contains the following rule: "Freight will be accepted only when containers are of sufficient strength and security to afford reasonable and proper protection to the freight which the containers enclose. . . . All containers must be strongly made of material of sufficient strength to protect the articles against ordinary risks of transportation." Surely this is a reasonable requirement. The ordinary risks of transportation can be pretty definitely known and it seems reasonable that the shipper should be required to insure against them to the extent of providing adequate packages.

The carriers' rules go on to say that freight tendered for transportation must be in the form specified in the separate descriptions given of the several articles. For example, the Classification provides that china or earthenware bathtubs are to be "packed in boxes or crates"; pitch, N. O. I. B. N.,[1] not ground, is to be shipped "in metal cans partially jacketed"; pans, cake or cracker, wire or flat, are to be shipped "in boxes"; etc. Articles that are easily broken must be protected by packing material within the container.

Rules 40 and 41 of the Classification contain an elaborate code of regulations governing the construction and sealing of boxes, barrels, pails, etc. For example, it is provided that boxes must be made of iron, steel, wood, or fibre board of certain specified strength, with solid or closely fitted sides and ends securely fastened, and wooden boxes of unusual size or carrying unusual weight must be strapped or be re-enforced by cleats. When shipped in fibre board boxes, articles will not receive the same ratings as apply on shipments in wooden boxes, unless the requirements of the carriers with reference to the number of plys, the thickness of each, and the resistance per square inch are complied with. The container must always bear a certificate of the box-maker. A 20% increase in freight rates is provided in case fibre boxes do not comply with these rules.

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[1] "Not otherwise indexed by name."

The intending purchaser of boxes and baskets should require that the manufacturer furnish a statement of the specifications on which the containers are made in order to protect himself.

The use of metal strapping or wire binding on containers for less-than-carload merchandise is of real importance, and shippers will find that not only are damages decreased thereby, but also that it greatly reduces concealed, unlocated, and pilferage losses. In 1923 a reduction of $8,000,000 in such losses was attributed largely to the greater use of wire and strap material.

Losses from Not Observing Rules.—Much loss is borne both by shipper and by carrier as a result of failure to observe the packing requirements. In packing glassware, for example, the carriers' rule is that the articles must be loaded shoulder to shoulder and bottom to bottom, with a cushion of indented pulp board between bottoms. Failure to put in the required layer of indented paper cost one shipper a penalty of $576 on a single carload from Cincinnati to San Francisco. Had the shipment been loaded correctly, a commodity rate of $1.66½ per hundred pounds would have applied, making the total freight charge $499.50; but the incorrect loading made the class rating applicable, and as glassware is rated 5th class and the shipment was penalized by being raised to 4th class, the total charge was over $1,000.

On the other hand, the carriers lose much revenue through the inefficiency of their employees in enforcing the packing requirements. Presumably these requirements are reasonable, and the different freight charges made on account of difference in packing, measure the difference in the carriers' risk. If, therefore, an agent allows a shipment of some liquid shipped in metal cans, *crated*, to move at the same rate that is allowed to the article when shipped in metal cans, *boxed*, the latter rate being considerably lower, there is a real loss to the railway. The same may be said of cases in which shipments made in barrels with cloth tops are given the rating applicable to shipments "in barrels"; for the Classification provides that barrels with cloth tops "will be rated same as crates," and crates will be rated one class higher than barrels. This provision is doubtless based on experience in handling many thousands of shipments in the kinds of packages mentioned, and deviation therefrom must tend to cause loss.

When More than One Class of Freight Is Put in a Package.—This is hardly the place to go into the minutiæ of packing freight and we shall therefore close the discussion by mentioning one more general rule, namely, the requirement that "the charge for a package containing freight of more than one class shall be at the rate provided for the highest classed freight contained in the package." This seems to be the only practicable way of insuring a uniform observance of the classification of freight, as it would clearly be impracticable to attempt to average separate charges for the numerous different items which might be shipped in a single container. Undoubtedly much fraud is practiced in this matter, but it is sometimes difficult to observe the principle of the rule. Under the Classification, advertising matter may be shipped along with the goods to which such matter refers at the rate applying to the goods.[2] A candy shipper, however, who enclosed a booklet of Christmas carols found that the carriers refused to accept the booklet as an advertisement of his wares, and accordingly, although candy is given a 2nd class rating, he was penalized by having to pay the 1st class rate on the entire shipment, that being the rating of booklets.

3. The Marking of Freight

All L. C. L. Freight Must Be Marked.—If it be assumed that the shipper has properly packed his goods for shipment, the next question to ask is, if an L. C. L. shipment: Has he properly marked it to insure the desired routing and delivery to the correct consignee? This question is no unimportant one, as a great quantity of less-than-carload freight goes astray, thus causing much trouble and expense to both shipper and carrier.

The general rule is that all freight, if L. C. L. or "any quantity," must be marked. A shipment which fills a car, or which weighs at least 24,000 pounds, if it is a single shipment for a single consignee, need not be marked; but if the quantity of freight tendered is in excess of the full carload, the excess freight must be marked as if it were an L. C. L. shipment.

Each package or loose piece of freight must be plainly and durably marked—old consignment marks first being removed or effaced—by some means which will present the maximum resistance to effacement. This means may be by brush, stencil, marking crayon (not chalk), rubber or metal type, labels securely attached by glue or suitable tags of metal, leather, cloth, or specially strong paper.

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[2] Providing the advertising matter does not exceed 2% of the gross weight of the goods.

The shipper should remember that a little more time in marking may save much expense arising from delay to his trucks when delivering freight. Plain marking makes the prompt release of trucks at the freight-house possible, and reduces the amount of overs and shorts.

Importance of Comparing Marks with Bill of Lading.—A rule which is of especial importance on account of the trouble which results from its non-observance, is that the marks on packages must be compared with the bill of lading or shipping order, and necessary corrections be made by the shipper before a receipt for freight is signed. One of the most common difficulties is a conflict between the destination shown on the bill of lading and that indicated by the marking of the package. For example, a shipment was once made from New York to West Pittsburgh, Pa. The bill of lading read "West Pittsburgh," but the package was merely marked "Pittsburgh." Accordingly, the railway hauled the freight to Pittsburgh and then notified the consignee of its arrival. Of course, the consignee instructed the railway to forward the freight to West Pittsburgh, but meanwhile it had been stored and a special service had to be rendered to transfer it from Pittsburgh to West Pittsburgh. Naturally, the carrier sought to collect (1) the freight rate to Pittsburgh, (2) storage charges, and (3) the local freight rate from Pittsburgh to West Pittsburgh. In this it was supported by the Interstate Commerce Commission's rulings to the effect that when the shipper prepares a bill of lading showing a destination different from that which appears on the package, the carrier is not responsible for the freight from the destination marked on the package.[3]

If, however, a carrier changes the marks on the package, it may be responsible. This was the case when a carrier agent, upon receiving a package which was clearly marked "Oakland, Ind.," while the bill of lading read "Oakland, Ill.," proceeded to change the marks on the package to agree with the bill of lading. In this case, the shipment went to Illinois instead of Indiana, and the carrier was held responsible for the delivery at the wrong destination. It should either have forwarded the package as marked, or have advised the shipper of the discrepancy and awaited instructions.

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[3] 26 I. C. C. 561.

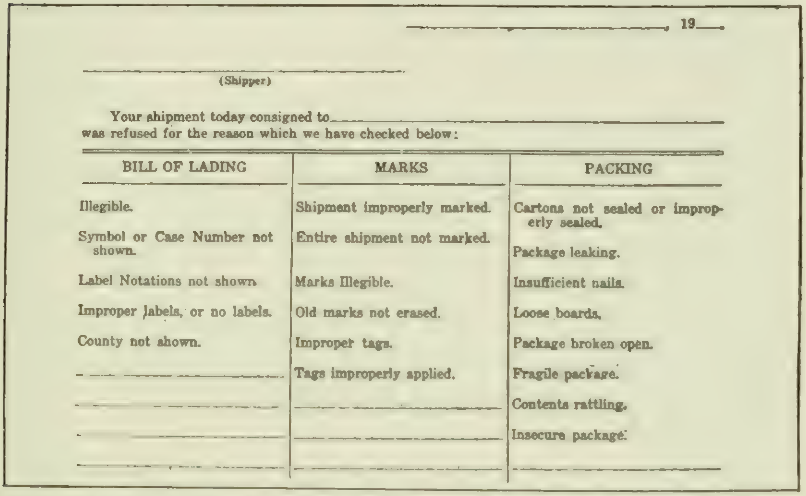
Shipper Liable for Errors in Marking.—It is a general rule that the shipper is liable for errors in marking. It is his duty correctly to mark packages of L. C. L. freight intended for transportation. Thus, one ruling by the Commission (Conference Ruling No. 433) is to the effect that when a package was erroneously marked "Lake City, Fla.," instead of "Lake City, S. C.," the shipper had to bear the charges for the resulting back haul from Florida to South Carolina, in spite of the fact that the correct address was noted on the bill of lading.

Other rules, the non-observance of which causes trouble, are that when consigned "to order," a shipment must be marked to indicate that fact, and must further show a number or symbol which will also appear on the bill of lading or shipping order. Also, when a shipment is consigned to some point not on a railway line, the package should be marked with the name of the railway station at which the consignee will accept delivery.

Finally, it has been found to be desirable that packages of L. C. L. freight should be marked with the name and address of the shipper preceded by the word "from"—this to provide for cases in which the freight goes astray or is unclaimed at the destination point. This precaution should be taken in shipping freight, just as it is in mailing a letter.

Trivial as the matter of marking freight may seem, it in reality constitutes no mean traffic problem, and the observance of the foregoing rules would save much time and money, and make an important contribution toward the smooth handling of the nation's traffic by rail.

So common are troubles connected with the foregoing shipping requirements, that some carriers use a standard form like the one in Fig. 37, to advise the shipper of their non-acceptance of the shipment.



______________________ 19____

____
(Shipper)

Your shipment today consigned to ______________________
was refused for the reason which we have checked below:

BILL OF LADING	MARKS	PACKING
Illegible.	Shipment improperly marked.	Cartons not sealed or improperly sealed.
Symbol or Case Number not shown.	Entire shipment not marked.	Package leaking.
Label Notations not shown.	Marks Illegible.	Insufficient nails.
Improper labels, or no labels.	Old marks not erased.	Loose boards.
County not shown.	Improper tags.	Package broken open.
____________	Tags improperly applied.	Fragile package.
____________	____________	Contents rattling.
____________	____________	Insecure package.
____________	____________	____________

Fig. 37.—Form Used by Railroads to Advise Shippers of Non-Acceptance of Shipments

4. Preparing and Loading Cars

Obligations of Shipper and Carrier.—As a general rule, it may be said to be the duty of the shipper to inspect a freight-car before it is accepted for loading. Not infrequently, cars are received which have large nails protruding from the floor or sides; such cars should not be loaded until the nails have been driven in or extracted, especially when the load is to consist of merchandise in bales or sacks. Or the car may be so dirty or impregnated with some injurious material as to be unsuitable for loading. One shipper loaded steel bars into a car which upon arrival at destination were found to have become so rusty that they were refused by the consignee. The car was returned to the point of origin and then it was discovered that the floor was covered with a coating of sulphuric acid which had corroded the steel. In spite of the fact that the shipment had so deteriorated as to be worth only the price of scrap steel, the shipper had to bear the loss. The Interstate Commerce Commission holds that, although the obligation of a carrier is to furnish promptly a suitable car, it is reasonable to expect the shipper to inspect the car and to do a reasonable amount of cleaning or make minor and inexpensive repairs in order to prepare it for loading. In this case the shipper, by casual inspection, could have learned that the car contained a foreign substance which would injure his shipment, and could have either refused the car or have cleaned it himself.

If, however, the unsafe condition of the car cannot be known from a casual inspection, the carrier is liable for the shipper's loss arising from the presence of an injurious material.

Rules for Inspecting and Preparing Cars.—Clearly, then, it is important that care should be exercised to prevent the loading of freight into defective or unclean cars. Such care should include an examination of the interior for defects which might injure the freight, and the removal or covering by the shipper of projecting nails and bolts. If the contents of the car are to be such that the penetration of rain or snow would mean damage, it is important that the shipper inspect the roof, sides, and especially the doors, and he should either leave a free space around the car door, or should so batten it as to prevent leakage at that point. Cars which cannot be put in good condition without considerable repairs should be rejected.

In shipping perishables and goods which are injured by dirt, such as flour, freight-cars often have to be lined; and sometimes it is necessary to put in false bottoms to insure the circulation of warm air and thus prevent the freezing of fruits and vegetables in winter weather. Such lining and flooring must be furnished by the shipper, and the cost of installation be borne by him.

Moreover, no allowance is made for the weight of the material used ("dunnage"), but it is charged for at the same rate which applies on the shipment proper. While this rule may, at first glance, appear to be likely to work hardship to the shipper in some cases, a moment's reflection shows that it is in keeping with the fundamental rule governing carload ratings, namely, that carload freight must be a single shipment to a single consignee, and in the case of mixed carloads the shipment will be charged for at the carload rate applicable to the highest classed article therein. Furthermore, it is economically desirable that shippers be discouraged from making the "dead weight" greater than may be necessary.

Loading Cars.—After the car is inspected and accepted as suitable for the shipper's purposes, the next problem is to insure proper loading. The careful loading of freight into the car is an important matter. This statement applies both to the loading of L. C. L. freight by the carrier and C. L. freight by the shipper, but here the reference is to the latter.

In Rule 27 of the Official Classification it is provided that the owners must observe the carrier's rules regulating the safe loading of freight and protection of equipment, which rules are: (1) the lading must be securely blocked or braced, (2) when in closed cars the lading must be kept away from the car doors, and (3) the weight of the lading must be approximately the same on each side of the car.

The traffic manager of a wholesale grocery concern writes as follows:

> We receive cars containing case goods which are not braced in the doorways and consequently the ordinary rolling of the car while in transit allows the cases to shift from one side to the other in the doorways. On arrival of the car at destination it is found that damage is due to lack of bracing. The inspectors, in cases of this kind, invariably note on their inspection report that the car was improperly loaded and the carriers use this as an argument for declining liability.

Another matter which requires attention in many cases is the arrangement of freight within the car. Care should be taken to avoid the proximity of units or packages which, on account of their character, shape, or weight, might damage one another; and, as a rule, similar units should be placed together.

Loading L. C. L. Freight—"Trap Cars."—Many shippers load less-than-carload freight into what are known as "trap" or "ferry" cars at their plants. Such cars contain several less-than-carload shipments destined to different points, which are to be distributed at the railway's terminals at the point of origin into "straight" carloads, which are to be forwarded to their respective destinations. When such cars are indiscriminately loaded with shipments for various sections of the country, it is necessary first to move them to the adjacent freight stations or nearby transfer points where they have to be unloaded and the shipments must be sorted and reloaded. This involves extra handling, which is not only expensive in itself but increases loss and damage claims. In order to minimize this reloading, some of the railways have issued "loading guides" which enable the shipper readily to ascertain the proper transfer points to which his shipments should be loaded.[4] These guides contain an alphabetical list of stations, giving a number to each station, and the station numbers are grouped under the proper transfer point. Thus the shipper can readily group his shipments for various destinations according to the appropriate transfer, and he can assemble shipments and so regulate their loading that cars can be so made up as to reduce the handling of shipments at intermediate points. An important feature of this plan is that shippers find it advantageous to hold their shipments for several days in order to assemble a full load for the proper transfer point. A large iron and steel company has divided its shipping platform into eight different sections for as many routes, with the result that its shipments reach their destination with only one transfer instead of the three or four transfers which were required under the old haphazard method of loading.

The advantages of observing this system of loading less-than-carload freight are: (1) shipments reach consignees in shorter time, (2) there is less damage, (3) the number of shipments lost or incorrectly loaded is reduced, (4) there is less necessity for tracing and, (5) it enables the shipper to improve and systematize his shipping and loading departments.

Clearly, it is economically important from the social point of view that freight should be carefully loaded, in order to reduce to a minimum the breakage and other damage which inevitably result from the transportation of freight by rail, and it seems clear that in the case of carload freight this obligation should rest upon the shipper. He it is who loads the car, and it is to his interest that the shipment should reach the consignee in good condition. One little instance will illustrate the practical importance of this matter to the shipper. It is reported that a firm saved a loss of $68 per car by spending $11.40 on the lumber required adequately to brace the contents

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[4] See Pennsylvania Railroad Information Bulletin, December 5, 1921.

Multiplying this saving by the number of cars shipped would bring the total up to many thousands of dollars. As the size of freight-cars and the average carload have grown, and the speed of trains has increased, the stresses and strains caused by stopping and starting have been intensified and the importance of proper packing and loading has increased proportionately.

5. The Weighing of Freight

Gross vs. Net Weights.—Freight charges are generally based on weight, and the law requires that carriers shall collect the full legal rate. Clearly, therefore, it is important that the weight of freight should be accurately determined. Indeed, the Interstate Commerce Commission itself once made an extensive investigation into the accuracy of railway scales and found wide differences among them.[5] The weighing of freight, however, is not so simple as might seem at first thought.

In the first place, we must distinguish between gross weight and net weight, and note that the freight charges are based on the former. By gross weight is meant the weight of the car or package, together with its contents, while net weight means either the weight of an article clear of packing and container or the weight of the contents of a car. The rule adopted by the railways is that, unless otherwise provided, freight charges shall be computed on gross weights, including temporary blocking, racks, standards, strips or similar bracing, dunnage or supports. This material is to be paid for at the same rate as applies to the shipment which it accompanies. Free weight of 500 pounds is allowed for stakes, racks, etc., on flat or gondola cars, providing that the shipper specifies the weight of dunnage in the shipping order, but in no case must less than the minimum carload be charged for.

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[5] 28 I. C. C. 7 (1913).

Estimated Weights.—One exception to the foregoing rule is that when "estimated weights" are authorized, they may be used in the place of the actual gross weight. What then are "estimated" weights? Such weights are those specifically prescribed in the tariffs of individual carriers for various particular commodities when shipped in certain packages or in a certain manner. For example, in the South certain estimated weights are specifically prescribed for lumber, the estimate, which is applied to all lumber, being so much per thousand board-feet. Pit posts, in the East at least, have moved on the basis of an estimated weight of 45 pounds per post, and potatoes in hampers have been assessed on the basis of an estimated weight of 185 pounds per package. Many other illustrations might be given.

The advantage of using estimated weights is found where articles are shipped in standard packages or where standard units of bulk measurement are possible. In these cases an average weight can be readily ascertained, and the use of such a weight saves the time and expense of weighing each shipment, to say nothing of the disputes which arise when the actual weight is in question. When, however, packages are not uniform in size or the commodity shipped in bulk is subject to wide variations in unit weight, the use of estimated weights is difficult or impossible.

Even when packages are fairly uniform, they may be changed in size from time to time or vary somewhat, and in such cases disagreement concerning the size or the basis on which the estimated weight was fixed may arise. Accordingly, the Interstate Commerce Commission has ruled that, in so far as practicable, the size and dimensions of such packages should be clearly stated in the tariffs. Even then, cases of dispute not infrequently come before the Commission. Thus, in a case involving pit posts it was complained that the estimated weights were in excess of the actual weights. The Commission found that during certain seasons of the year when the posts contained little sap, the estimated weights did exceed the actual, but held that the tariff estimates were intended to be representative of shipments throughout the year and consequently were not unreasonable. Again, a shipper of potatoes complained that an estimated weight of 185 pounds for a 1½-bushel hamper made his rate excessive. In this case, the Commission, while recognizing that the actual weight was much less than the estimated, held that the carrier's position was reasonable, in that the use of hampers for potato shipments results in numerous loss and damage claims and should therefore be discouraged.

Incidentally, this case illustrates the importance which the Commission attaches to the use of proper containers.

Weighing Freight in Cars.—In most cases, however, actual gross weights are used, and such weights are determined by weighing the loaded car on track scales, the marked weight of the car being deducted from the total.[6] Carload freight should be weighed at the point of origin, or, if no scales are available there, as near to the point of origin as possible. When the cars are carefully weighed, which requires that they should be uncoupled and not be in motion, the results secured are generally satisfactory. But this is not always true. Not infrequently the weighing is carelessly done, and disputes concerning weights are all too common. The carriers themselves often take the precaution to reweigh cars received from connections, and carload freight will be reweighed when the contents of the cars have been transferred en route or when there has been some accident or loss of freight. Either the shipper or the consignee, if he believes that the carrier's weights are wrong, may have a car reweighed, subject to a reweighing charge which is named in the tariffs. If the carrier's weights are found to be in error, the reweighing charge will not be collected.

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[6] The "marked weight" is the weight of the empty car as stenciled thereon.

"Tolerance."—At this point the use of "tolerance" comes in. A certain difference in weights, due to variation in scales or weighing methods, may be permitted without a correction of the billed weight. Such a difference is called "tolerance."[7] It may be thought of as a reasonable margin of error allowed in weighing. The tolerance is usually 1% of the lading, but there is a minimum tolerance of 500 pounds, which is always allowed, and in the case of such heavy commodities as coal, coke, sand, and stone, the minimum tolerance is 1,000 pounds. When, therefore, a carload of freight is reweighed and it is ascertained that the weight does not differ from the billed weight by more than the amount of the tolerance, no correction will be made. If the difference, however, is found to exceed the tolerance, a third weighing is made, if practicable, for the purpose of securing a final test. If this third weighing shows a figure which is within the tolerance limit, no charge will be made; but if it also shows a difference in excess of the tolerance, the result of either the second or third weighing will be taken, whichever is the lower, assuming that the difference between the two does not exceed the tolerance.

Either the shipper or the consignee may prove the actual weight of a carload shipment (1) by showing the shipper's authenticated invoice, or (2) by weighing the entire contents of the car on platform scales, or (3) by weighing a representative proportion (10% or more) of the articles contained in the car when such articles have a standard weight. The weighing must be done under the supervision of the carrier's agent. Of course, the weight will include blocking, packing materials, debris, etc. If the difference between the billed weight and the actual weight exceeds the tolerance limit, the freight charges will be made on the basis of the actual weight as determined.

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[7] See National Code of Rules Governing the Weighing and Reweighing of Carload Freight, American Railway Association, for this and other rules.

Weight Agreements.—"Weight agreements" are sometimes entered into by shipper and carrier, and such agreements may yield important advantages. If the shipper desires, he may apply to the carrier asking that an agreed weight be fixed for his articles. The carrier will then make weight tests and may thereafter accept the goods at an agreed weight. Under such an arrangement the shipper knows exactly what weight he will be charged for, and no questions or disputes can arise. It also tends to expedite the movement of his freight since it facilitates forwarding and since no reweighing in transit is necessary.

As such agreed weights have an important bearing upon freight charges, it is required that copies of the agreements shall be filed with the appropriate rate-making bodies, depending on whether the traffic concerned is interstate or intrastate. The points to be covered in a weight agreement are as follows: The shipper agrees to report the correct gross weight and description of his commodity on the appropriate shipping papers and to allow a representative of the carrier to inspect the original weight sheets, invoices, and other records which may be necessary to verify the reported weights. He also agrees to pay promptly any undercharges caused by the certification of incorrect weights or descriptions. When the agreed weights are based on an average for uniform or standard weight articles, the shipper is promptly to notify the railway of any change in the package or material which will affect the weight of his shipments. He must also keep the scales used in good condition and allow the carrier's agent to inspect them. The agreement is subject to cancellation by either party on ten days' notice.

SUMMARY

A volume might be devoted to the practical details which are involved in the shipping of freight, but a careful study of the foregoing pages will suffice to give a fair working foundation of general principles of the subject. We have seen how important it is that freight should be adequately packed and what constitutes such packing. The chief requirements for marking freight have been pointed out, and it has appeared that it is the shipper's duty correctly to mark L. C. L. shipments of freight. It has been shown that it is also the duty of the shipper to inspect cars tendered by the carrier for carload freight, and certain general principles of loading have been indicated. Important economies are to be gained by following some system in the loading of "trap" or "ferry" cars so as to reduce the rehandling of freight at transfer points. The various practices used in connection with the weighing of freight have been outlined, and the importance of using the "weight agreement," where this is feasible, has been pointed out. For the information of those who are not experienced in the shipping of freight, the various documents which must pass between shipper and carrier have been described.

It has been the aim of this chapter to state concisely the most important rules which directly affect the shipping of freight. These rules taken together might be thought of as constituting a sort of shipping code, by observing which the shipper may reduce to a minimum his losses and damages, and insure the arrival of his shipments at destination in the best possible condition. Also car shortage and waste in transportation may be relieved. Great waste obtains on American railways on account of improper or inadequate packing, marking, loading, and weighing of freight; and the enormous loss and damage claims are a sad commentary on the lack of efficiency with which traffic is at present handled. The carriers have made great efforts to reduce the amount of such claims, and it is to the interest of all parties, including the public, that the shippers should cooperate. It is in the belief that an intelligent understanding of the carriers' rules and their importance will help to further such cooperation that this chapter has been written.

CHAPTER XXVII

RECONSIGNMENT AND IN-TRANSIT PRIVILEGES

"Special Services" in Railway Transportation.—The railways perform many services for shippers which they did not originally perform and which are not necessarily a part of the work of a common carrier. These services—often spoken of collectively as "special services"—are of great importance, and for many of them special charges are made in addition to the regular tariffs covering line haul. Among the most important of these services are those rendered in connection with the privilege of reconsigning or diverting freight while in transit, and the privilege of stopping a shipment for the purpose of doing some work on it at a point lying between the origin and the ultimate destination. Both of these privileges allow the application of a through rate from the starting point to the ultimate destination, in spite of the fact that the movement is interrupted, either by change in destination or by holding a shipment at some intermediate point. Both result in greater elasticity in marketing.

1. Reconsignment and Diversion of Freight

Definition.—Strictly speaking, "diversion" means a change in the destination or route originally named in the bill of lading, while "reconsignment" means a change in the consignee. In practice, however, the two terms are used interchangeably to indicate most changes in the billing of freight and changes which require an additional car movement, whether the change be in the consignee, the consignor, the destination, or the route.

Reasons for Reconsignment.—The shipper's need of the "reconsignment" privilege, as it is generally called, arises out of market exigencies, of which there are three chief classes:

> 1. In many cases the nature of the product is such that it must be started rolling before it is sold, and consequently before a consignee is known. This situation exists with many perishables and notably with fruit and vegetables. Thousands of cars of bananas are shipped north from New Orleans each year consigned to tentative destinations and subject to the privilege of reconsignment while in transit.
>
> 2. In some cases the production process is such that the freight must be shipped out at once without waiting for arrangements with a definite consignee. This applies to coal and oil.
>
> 3. Often markets are so fluctuating and uncertain that demand may change while the goods are in transit, and it becomes commercially necessary to change the destination. This applies to grain as well as to fruits and vegetables.

The cancellation factor may be another reason for reconsignment. When an order is canceled after the shipment has been made it sometimes becomes necessary to reconsign the goods.

Advantages of Reconsignment—Sugar Shipment.—Several illustrations may be given to show the advantages of reconsignment and something of how the reconsignment privilege works. It is common to ship such commodities as sugar and bananas from New Orleans with this privilege

A carload of sugar may be purchased by a Chicago jobber. After the car has been shipped, the jobber gets an order from a Detroit customer for a car of sugar. Accordingly, he requests the Illinois Central Railway to divert the car from New Orleans at Cairo, Ill., taking care to make the request in time to catch the car before the arrival at Cairo. Under these circumstances, the entire transportation charge from New Orleans to Detroit is the through rate via Cairo, plus a small reconsignment charge. The advantage lies in the fact that the jobber does not have to pay the local rate from New Orleans to Cairo, plus the local rate from Cairo to Detroit, the sum of which locals might be considerably greater than the through rate.

Reconsignment of Bananas.—Frequently cars, or even trains, loaded with bananas, are started rolling out of New Orleans pending sale. They are billed over some road leading to the North—say the Illinois Central—to some point lying between the probable destination territory and New Orleans, with the intention of diverting the shipment at that point. Assuming such a train to be en route, an order may be placed to reconsign one car to Chicago, this order being given before the train gets into the Cairo yards. The charge for such a reconsignment prevailing among railways in the northeastern part of the country is $2.70. Another car may be reconsigned to Detroit, but the order may not be given until after the arrival of the train at the Cairo yards, in which case the charge will be greater—$6.30 under the rules of the northern carriers.

Still another car of bananas may be *placed for unloading* in Cairo, but may be refused by the local jobber for some reason. In this case, it must be reconsigned to some other point—perhaps St. Louis—and in this case the higher reconsignment charge is made, and in addition the car is charged the New Orleans–Cairo freight rate, plus the local rate from Cairo to St. Louis. The reason for this, obviously, is the fact that the carrier has been required to go through all the operations of billing and switching, which are involved in making two distinct shipments, one from New Orleans and another from Cairo.

In case one of the cars is stopped at Cairo and is then ordered on within 24 hours, there is a charge for stopping, plus the reconsignment charge; but if the order of reconsignment is not made within 24 hours the reconsignment charge will be much larger.

Reconsignment of Eggs.—The case of a commission man who shipped a car of eggs from some point in Missouri will illustrate both the nature of reconsignment and the rules and charges which apply to the privilege. Originally the car was consigned to Chicago, via St. Louis, but before the car got to St. Louis, there was a break in the Chicago egg market which made it undesirable to make the delivery at that point. Accordingly, the shipper ordered the car stopped at St. Louis, his order being made before it arrived at the St. Louis terminal. For this privilege he was charged $2.70.

Finding the St. Louis market also "soft," he ordered his car reconsigned to Cleveland. This order was a second move, and the charge for it depended on whether the order was given in time to catch the car before it reached the St. Louis yards or not. (Clearly, if the car had gone into the yards it would have required greater labor to get it out and placed in the right train.) In the one case the additional charge would be $2.70; in the other case it would be $6.30.

While in transit from St. Louis to Cleveland, the shipper ordered his car stopped at Indianapolis on information that he might find a buyer there. As this was a second stoppage in transit, there was a charge of $6.30 involved. As bad luck would have it, however, the car was refused at Indianapolis, and the shipper was forced to reconsign it once more, this time to a New York commission house. For this final move, our unfortunate shipper had to pay an additional $6.30.

The sum of the foregoing charges is either $18 or $21.60, depending upon the promptness with which the reconsignment order was given at St. Louis. This amount had to be added to the rate, to cover the entire charge for railway service. The rate itself was the sum of the local rates to and from St. Louis, plus the local rate from Indianapolis to New York. If the shipper had not stopped his car at Indianapolis, however, he would have enjoyed the through rate from point of origin to final destination. Moreover, if he had not reconsigned the car at Indianapolis, he would have enjoyed the through rate from St. Louis to New York instead of the sum of the rates from St. Louis to Indianapolis and from Indianapolis to New York.

The carriers' rules provide that if a car is stopped short of final destination after one diversion or reconsignment, the rate will be the sum of the rates to and from the point of first diversion or reconsignment. Also, if a subsequent change involving the movement of the car is made, it will be treated as a reshipment, which means that the change at Indianapolis by which the car was reconsigned to New York made the local Indianapolis–New York rate apply.

Rules Governing Reconsignment.—The rules and charges governing reconsignment and diversion, which have been partly illustrated, are as follows: Reconsignment is only allowed when the car does not break bulk at the point where it is held or diverted, i.e., the original billed destination. The through rate via the diversion or reconsignment point, which is in effect when the goods are shipped, will apply—unless there is some stoppage after one diversion or reconsignment, as already described. In Official Classification Territory the charge for reconsigning when the order is received prior to the arrival of the car in the terminal yard is $2.70, or if after arrival, $6.30. The charges are somewhat lower in the other territories. There are also charges for stopping the car for orders, which are larger in case the request is not made before arrival at the billed destination.

It is to be remembered that demurrage and track storage charges are in addition to reconsignment charges, and that, when cars are held for reconsignment, demurrage charges begin to run after only 24 hours' free time.

Number of Free Reconsignments Allowed.—The carriers have maintained that in case of most commodities only one change in destination should be allowed on the through rate, but the tendency now is to permit a larger number of reconsignments, merely making an increased charge for more than one change of this sort. The situation existing in 1920 is illustrated by the case of a Kansas City lumber company which shipped a carload from Stephens, Ark., to Jonesboro, Ark., reconsigned to Dupo, Ill., and again reconsigned to Greensburg, Ind. There was a joint through rate (that is, a single through rate made jointly by two participating railways) in effect from Stephens to Greensburg, but the carrier's tariff permitted only one change in destination at that rate, providing that in case of a "subsequent change necessitating movement of the car the shipment will be treated as a reshipment from point of reforwarding and will be charged the tariff rate therefrom plus $5 per car." This rule was upheld by the Commission, and accordingly the shipper had to pay the local rates to and from Dupo, plus a reconsignment charge of $5 at Jonesboro and an equal charge at Dupo.

Rules for the Shipper.—Shippers should recognize that the reconsignment privilege involves a special service and endeavor to cooperate fully in facilitating the prompt and efficient performance of that service. Among the rules to be observed are the following: Requests for reconsignment must be made or confirmed in writing. They should generally be filed with the agent at the point of origin, but, depending upon the line having the car, may be filed with the general freight agent, traffic manager, or superintendent of car service, or with the agent at destination. Such requests should adequately describe the shipment (giving date, origin and destination, consignor and consignee, car initials and number and route) and should clearly state the change in billing to be made. Prompt action is often required to catch the car before it passes the junction point at which the diversion should be effected.

The original bill of lading should be surrendered when a reconsignment is made. If that is not practicable, the procedure depends upon the kind of bill of lading. If it is a straight bill of lading, it is only necessary to establish ownership; but in case of "order" bills of lading, the one seeking reconsignment must give a bond of indemnity or other approved security at the time of the reconsignment order.

There has generally been a charge made of $1 per car for making a change in the name of the consignor, but no charge is made for a single change of that sort if the order is received before the car leaves the initial billing point and involves no extra movement. This rule has caused dissatisfaction, especially in the South, and the Interstate Commerce Commission has recommended that there be one free reconsignment while the car is en route or within 24 hours after arrival at the original billed destination; also, that there be no charge for stopping a car on account of official inspection of fruits and vegetables if disposition of the car is made within 24 hours.

Reconsignment Involving Back Haul.—Sometimes it is necessary to reconsign a shipment to a point which involves a back haul or a haul which is "out of line." Such a movement is plainly uneconomical, and the carriers have desired to make a special charge for it. The Interstate Commerce Commission has ruled, however, that there is no reason why a reconsignment involving back haul should be distinguished from other reconsignments aside from making the regular additional charges for the out-of-line haul.[1]

Reconsignment after Receipt of Cars at Terminal Yards.—A point concerning which there has been considerable dispute between the shipper and carrier concerns the question of what constitutes placement of cars for unloading, and this question is generally combined with one concerning switching limits. For example, a coal dealer had been having cars switched to one of his coal yards in a certain city where the railway yard master would instruct the switch-train master at what points the different cars should be delivered. The carrier's rule concerning diversion or reconsignment to points within switching limits before placement, provided that a single change in the consignee's place of delivery at destination would be allowed without charge if the order were received in time to permit instructions to the yard employees prior to the arrival of the car; but that otherwise a charge would be made which would increase within 24 hours after arrival. The coal company contended that the charges were unreasonable as the movement of the cars occurred before placement for unloading and was within switching limits. The Commission agreed that since the cars were not "placed," the movement was not covered by the company's switching tariffs, but held that it must be deemed a reconsignment service and that the company's rules were reasonable.[2]

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[1] 61 I. C. C. 385 (1921).

In another case,[3] the Commission ruled that when requested in writing by persons properly authorized, agents at a first billed destination will hold cars for the named consignee and notify such consignee at his post-office address, and that on such cars, if subsequently reconsigned, the through rate from the original shipping point to the final destination, would apply, plus a reconsignment charge. In this case, the cars were placed on delivery tracks at the originally billed destination. This, however, was held not to constitute "delivery"; and since the points in question had been commonly recognized as "hold points," from which reconsignment would ordinarily be made, the Commission concluded that the practice was desirable in this case. The final destination to which the cars would be consigned was outside of the switching limits at the hold points.

This case suggests the fact that a large part of the reconsignment or diversion of freight in practice is confined to relatively few "gateways," such as the Ohio River Crossings, the Virginia Cities, and gateways into New England. At such points storage yards are established, sometimes especially for the purpose of holding cars pending reconsignment.

Another point to be noted is that from the railway's point of view the increased reconsignment charge made after a car has been held over 24 hours, is partly a penalty made with the idea of forcing the movement of equipment. This penalty has been upheld by the Commission[4] on the ground that cars held for orders are in the carrier's yards and thus may increase congestion seriously.

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[2] 60 I. C. C. 217 (1921).

[3] 59 I. C. C. 77 (1920).

[4] 47 I. C. C. 631 (1917).

Small Changes in Billing.—It will be helpful to keep in mind always that the reconsignment charge is based on service performed, and is justified because the carrier is put to extra trouble, chiefly in the way of car movement, tracing, and billing. When, however, some small change in a billing is made which involves practically no trouble to the carrier, especially if it is unavoidable, no charge is justified. It would seem just that no charge should be made in such cases as the following: A car is placed for delivery at destination and an order is given to deliver its contents to another consignee, which order is accepted by the carrier's agent, there being no change in billing nor any additional car movement; or a change in route, consignee, or destination, or all of these matters, is necessitated by an embargo laid after the shipment originated. If any charge is made for a mere change in name of consignor or consignee or in routing which does not involve additional car movement, it should be little more than nominal.

Carrier's Obligation.—While diversion and reconsignment constitute a special service which a carrier apparently need not initiate, it is true that once the service has been extended, it may be demanded by the shipper. Once having been initiated, the carriers are required to publish the existence of the privilege together with their rules and charges. This is obviously wise, since it tends to prevent the discrimination that might arise were reconsignment privileges extended to some and not to others, or if the requirements and charges were not equal to all.

In keeping with the special character of the reconsignment privilege is the fact that the liability of the common carrier does not apply in full to it. The law is that the carrier must use due diligence in endeavoring to carry out the instructions of a shipper with reference to reconsignment by locating a car in transit and by prompt action on request. But if due or reasonable diligence has been used, the shipper has no recourse in case his orders concerning reconsignment are not carried out. The carrier is not liable for failure if it has been reasonably diligent.

Lack of Uniformity.—Lack of uniformity in diversion and reconsignment rules has been a problem. The Interstate Commerce Commission has been working toward the goal of uniformity, and during the last two or three years has held several conferences. It appears that the Southeastern roads are most liberal, since they have allowed an unlimited number of reconsignments without extra charge. The charges made by the Western roads are also generally less than those in Official Classification Territory. On the whole, there appears no good reason why practical uniformity in diversion and reconsignment practice should not exist.

2. The In-Transit Privilege

Definition.—The in-transit privilege is the right to stop a shipment while in transit without losing the benefit of the through rate which is in force at the time the shipment is made. The original and typical case is that of a shipment of raw material made to some point where it is worked up, whereupon it is moved on to some final destination point as a finished product, the whole movement being made on the basis of a single through rate. Usually the in-transit privilege, when given to such shipments, is limited to commodities which bear similar rates in the raw and finished form, as for example, grain and flour. The theory of this privilege is that the shipment to the intermediate point does not complete the obligations of the carrier under the transportation contract, and that the movement from point of origin to final destination constitutes a single shipment.

Purposes and Results of the In-Transit Privilege.—The chief purpose of the in-transit privilege is to equalize different communities. Thus, there are many flour milling centers both in the East and in the West. Points like Minneapolis, Omaha, and Chicago are either adjacent to wheat-producing areas, or are points where rates "break," that is, where through rates generally begin and end. For these reasons, such points without the milling-in-transit privilege would have a double advantage as milling centers, in that they could secure wheat with a short haul and ship out flour on a through rate. If a miller were located in some intermediate western town where the local rates in and out were, taken together, higher than the through rates enjoyed by the foregoing points, he would be limited to a narrow local market. Or if an eastern miller had to pay the local rate on wheat from some western point, plus the local rate on flour to the eastern consuming point, he would be at a disadvantage in comparison with a a western miller at the points mentioned who could ship flour into the eastern territory on a through rate. By making a single through rate on grain and grain products, however, under the milling-in-transit privilege, the stream of grain and flour can flow from western farms to eastern and foreign points of consumption on substantially equal terms, regardless of where the flour is milled.

The result is undoubtedly a diffusion of business. Since the application of through rates is extended the consumer is given the benefit of lower transportation costs as well as wider competition. In general, therefore, we may conclude that in-transit privileges are beneficial.

Like most useful arrangements, however, in-transit privileges may be abused and may easily result in discrimination. They afford abundant opportunity for fraud through substitution of tonnage, and require vigilant "policing" by the carriers to prevent shippers from receiving the relatively low through rates on shipments into the intermediate points even when such shipments are not made with the intention of reworking and forwarding them, or in shipments made out of the intermediate point which have no relation to the goods shipped in.[5]

Kinds of In-Transit Privilege.—The nature and importance of in-transit privileges may best be illustrated by a list of the chief cases in which the privilege is given:

1. Milling in-transit (Grain)
2. Refining in-transit (Oils)
3. Fabrication in-transit (Iron and steel)—covers cutting, drilling, riveting, painting, etc.
4. Sawing, dressing, or milling in-transit (Logs and lumber)
5. Finishing in-transit (Granite and marble, wooden handles, etc.)
6. Creosoting in-transit (Lumber)
7. Compression in-transit (Cotton, hay, and straw)
8. Sacking or barreling in-transit (Dried beans and peas; oils)
9. Mixing and blending in-transit (Molasses and syrup, vegetable oils, grain products)
10. Concentration in-transit (Eggs, dairy products, cotton—shipped to primary market and there concentrated for shipment to consuming centers)
11. Inspection and grading in-transit (Hay, grain, beans and peas, wool)
12. Grazing, feeding, or watering in-transit (Livestock)
13. Icing in-transit (Various perishables)
14. Storage in-transit (Agricultural implements, apples)

The foregoing list does not exhaust the cases, but serves to illustrate practically every phase of the in-transit service. It is interesting to note that this service covers a wide range of in-transit operations, extending from those which involve a great change in the form of the product to those which have no manufacturing significance but are purely commercial. The range of commodities which enjoy the privilege extends from eggs and cattle to steel and granite.

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[5] See 18 I. C. C. 280; 32 I. C. C. 319.

Charges and Rules.—Charges for the in-transit privilege vary according to the section of the country and the nature of the service performed. Sometimes the in-transit rate is indicated by merely refunding a part of the local rate originally paid on the raw material to the transit point. Sometimes the whole rate into the transit point is refunded when the out-shipment is made and a through rate is charged on the finished product as though it had been shipped from the origin of the raw material. Sometimes, again, a through rate is given which is somewhat lower than the sum of the locals into and out of the transit point. Another arrangement is to make a low through rate, and in addition, to collect a stop-off charge. Whatever the method, the arrangement approximates the granting of a relatively low through rate for what is in many respects two local shipments.

In order to safeguard the privilege thus given, the carriers require that complete and accurate records must be kept of the shipments into and out of the transit point, and that such records must be subject to inspection. Inbound freight bills must be surrendered sufficient to cover outbound tonnage, allowing for any tonnage otherwise disposed of. Loss and shrinkage at the transit point are allowed for, and this item in some operations is considerable. In some cases, however, rigid policing rules have not been adopted and enforced, requiring the surrender and cancellation of inbound expense bills. The Commission not long ago found that grain could be shipped from Minneapolis without surrender of expense bills, thus causing a surplus of bills in excess of grain on hand.[6] The excess of expense bills made it possible to ship out under the in-transit rate grain products which had not come in under in-transit arrangements.

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[6] 68 I. C. C. 665-675 (1922).

The railways also make some requirements concerning the relation between the kind of commodity shipped in and that shipped out of the transit point. They must usually be of the same kind, allowing for some differences caused by blending, etc.; but reasonable latitude is allowed in that the through rate is not limited to the identical material. Wheat cannot be shipped in and corn meal out under the through rate, but the flour which moves under the milling in-transit privilege need not be the product of any particular lot of wheat.

There is generally a maximum time limit on the holding of goods at the transit point which is usually one year.

Duty of Carriers to Give In-Transit Privilege.—Although the carriers apparently need not grant the transit privilege unless ordered to do so by the Interstate Commerce Commission, this privilege is probably to be regarded as more closely associated with the function of common carrier than is the privilege of reconsignment. It is in keeping with this fact that not only do the railways regard it with more favor, but that it is well established that the Interstate Commerce Commission can require the granting of the in-transit privilege wherever in its judgment this is warranted. This must be for some good reason, as the existence of competition or some special need. The Commission has said, "The general policy of the Commission is not to require the establishment or extension of transit except where necessary to remove discrimination."[7]

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[7] 10 I. C. C. 193; see also, 16 I. C. C. 232.

CHAPTER XXVIII

DEMURRAGE AND STORAGE

Relation of Storage to Transportation.—The function of railways is to move goods. While a certain amount of delay is necessary at terminals, it is not the business of carriers to store the freight which they transport. Rates are based upon transportation service and cover such service only, including the operations which are necessarily involved in the movement. It follows that reasonable charges, in addition to rates, may be collected for storage at terminals.

Demurrage.—Such storage charges are of two sorts. First there are "demurrage charges" proper, which primarily concern the use of freight-cars. They are collected for the detention of cars beyond a certain maximum period of "free time," and their purpose is chiefly to insure the greatest use of equipment by penalizing shippers for unreasonable delay in loading or unloading. They are charges which are avowedly more than a fair rental for the car, and are designed to be high enough to force its prompt release.

Track Storage Charge.—In addition to demurrage charges, there are charges for "track storage" and for storage of freight unloaded and held on railway premises. Track storage is a charge in addition to regular demurrage, which is assessed at some points where freight yards are congested, the idea being that the trackage occupied by the cars has a special value and an extra charge is required to insure prompt release of equipment. This charge may be regarded as a form of demurrage. Several railways have team tracks on the Island of Manhattan where they deliver carload freight. Since the value of land in such a location is very great, it is desirable to compel shippers to unload as quickly as possible, and a track storage charge is made amounting to $1 per car for the first day after 48 hours and $2 for each succeeding day.

General Storage Charge.—After freight is removed from cars and the period of free time has expired, general storage charges begin to run. These are collected for the purpose of reducing congestion at terminals. The carriers are not warehousemen, and, after free time has expired, they may even transfer the freight left at terminals to private warehouses, when the shipper or consignee would have to pay the regular charges for such service. When carload freight is unloaded by the carrier on railway premises for the purpose of releasing equipment, the storage charge is the same as would have accrued under car demurrage and track storage rules had the freight remained in the car. If the unloading is done by or at the request of the consignee or consignor, the storage charges may not exceed the same amount.

Special demurrage and track storage charges may be collected on explosives and other dangerous articles, which is logical in view of the greater risk involved in handling such goods at the terminals.

Reciprocal Demurrage.—In the early part of the twentieth century we heard a great deal about "reciprocal demurrage." At that time there was much complaint of car shortage and a number of states enacted laws designed to compel carriers to pay shippers when they were unable to furnish cars within a certain period after receiving requests. Such laws are of doubtful expediency, and the Supreme Court has largely nullified their effect by deciding that the states cannot regulate delivery of cars in interstate commerce.[1]

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[1] 226 U. S. 246.

Importance of Demurrage Charges.—In view of the vital importance of reducing congestion of terminals and speeding up the movement of freight-cars, the importance of demurrage charges is apparent. It has been estimated that on a 100-mile haul, when a consignee takes four days to unload a car, about two and one-half times as many cars are required to transport the same amount of goods as when the consignee only holds the car six hours. One of the chief causes of car shortage is delay in loading and unloading at terminals, and, to the extent that demurrage and track storage charges can reduce this delay, they are among the most important devices for improving the transportation service. Not only this, but by enabling the carriers to perform their service with a smaller number of cars, they minimize the amount of capital tied up in excess equipment, thus reducing maintenance, depreciation, and interest charges.

It is all too common for certain classes of business men to use railway equipment in lieu of warehouses. This is especially true among speculative dealers when prices are high or rising. A railway official states that shippers use railway equipment even for interior plant hauling, such as the transfer of steel billets from furnaces to wire mills and also for hauling cinders, slag, etc. It is obvious that $2 a day, which is the initial demurrage charge, is, in many cases, a very cheap storage charge and consequently does not entirely prevent abuses of railway equipment.

It is probable that the most numerous complaints received by the Interstate Commerce Commission concerning railway charges are those involving demurrage. This no doubt arises from the fact that business men do not fully understand the purpose and function of demurrage charges, nor the importance of promptly releasing railway equipment. In addition to the preceding general discussions of demurrage and storage, therefore, it will be well to consider the chief regulations which the carriers enforce with the approval of the Interstate Commerce Commission.

Demurrage Rules.—The rules concerning demurrage and storage charges are those adopted by the American Railway Association by agreement with the National Industrial Traffic League and approved by the Interstate Commerce Commission. They are known as the "National Car Demurrage Rules."[2] Prior to 1909 there was great diversity in demurrage rules in force in different parts of the country, but in that year the National Association of Railway Commissioners, with the approval of the Interstate Commerce Commission, acted to bring about uniformity. At the present time, therefore, demurrage rules are practically uniform and apply to all interstate and to most intrastate shipments.

The Interstate Commerce Commission has ruled that demurrage charges are a part of the terminal charges and that they must be filed just as tariffs are. Accordingly, they must be strictly observed and be collected even when the delays are due to conditions beyond the control of the carrier. If, for example, carloads of coal are held at a port awaiting a ship which is delayed by storms, demurrage cannot be waived, even if the carrier should desire to do so.

Some of the *chief rules* governing demurrage are as follows: The carrier is obligated to give written notice of the arrival to the consignee within 24 hours after the arrival of the car and the bill of lading, this notice to contain the car number and initials, and a statement of contents and shipping point. Moreover, the carrier must give notice of the placement of the car in case it is not actually spotted on a public delivery track within 24 hours after the notice of arrival is sent or given. This is important for the reason that under the conditions mentioned the limited "free time" begins to run after notice of placement.

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[2] Published by American Railway Association Tariff Bureau; B. T. Jones, Agent Chicago, Ill.

Free Time.—Forty-eight hours of free time are allowed for loading or unloading cars. Free time is counted from 7 A.M. of the first morning after a car has been placed for loading or unloading. "Loading," it should be noted, includes furnishing forwarding directions on outbound cars, and a car for loading is not released until proper billing has been furnished. "Placement" may be actual or "constructive." For example, if a car cannot be actually placed as required—perhaps because the tracks are fully occupied—the consignee or shipper may be notified and the car be held on his order, which constitutes constructive placement.

Demurrage Rates.—After the expiration of 48 hours of free time, demurrage charges are collected on each car for each day or fraction thereof, until the car is released. These charges have been $2 per car for each of the first four days in excess of free time, and $5 for each day above four days. Various other arrangements for charging have been proposed or tried, and it is probable that more elasticity would be desirable both in the way of having heavier charges in seasons of car shortage and adopting progressively graduated charges for periods over four days.

There are several exceptions to the foregoing rules. In the first place, the demurrage charges do not apply to *certain classes of cars* or commodities, among which are stock cars, empty cars placed for loading coal at coal mines, and private cars on private tracks if owner is same. In these cases, either holding the freight is impossible or the delay is a matter of no direct concern to the railways or the public.

Another exception exists in the case of certain kinds of *weather interference*. When the condition of the weather during any part of the free time is such as to make it impossible for men or teams to work at loading or unloading cars without serious injury to the freight, free time is extended until a total of 48 hours free from such weather interference shall have been allowed. This rule would apply to the loading or unloading of lime during a driving rain, or to cases in which high water or snowdrifts make it impossible to get to the car. Also when the freight is so frozen as to require thawing out before unloading, the period of free time is extended.

The "Bunching Rule."—Still another exception is made by the so-called "*bunching rule.*" When as the result of an act of the carrier, cars are bunched and delivered in accumulated numbers in excess of daily shipments, the consignee is given such free time as he would have been entitled to had the cars been delivered in accordance with the daily rate of shipment. For example, if a shipper is receiving regularly material in carloads and three cars are shipped on three successive days, he would usually also have them placed on his siding sometime later on three successive days. Now, if the cars are all delivered to him on a single day in a bunch, he can hardly be expected to unload them with the same dispatch that he would have unloaded a single car. In fact, he really has three times 48 hours (or 144 hours) of free time due him, and this amount of time is assured under the bunching rule. But if one car is released in less than 48 hours, his free time on the next car begins with 7 A.M. of the day following.

Average Demurrage Agreements.—It remains to describe briefly the "average agreement," which is a matter of much importance to large shippers. When a firm is regularly receiving or delivering cars of freight, it may enter into an agreement with a railway to settle demurrage charges on all its cars at the end of each month and to receive certain credits for the prompt release of cars. This constitutes a pooling of the firm's free time. Rule 9 of the National Car Demurrage Rules provides that if agreed the demurrage "shall be computed on the basis of the average time of detention to all such cars released during each calendar month." One credit is given for each car released within the first 24 hours of free time, and one debit is charged for each day a car is held over 48 hours up to four days. When a car has been charged with four debits, there will be an extra charge of $5 per car per day, including Sundays and holidays. At the end of the month the total credits are deducted from the total debits, and $2 per debit is charged for the balance. Credits do not carry over into succeeding months, nor do credits earned on unloading cars apply to loading debits, or vice versa.

The Commission has ruled that no average agreement under the uniform demurrage rules may combine in one account cars of more than one consignee and that this rule may not be defeated by making an agreement through any common drayman or public elevator. When, however, a storage warehouse company is specifically designated as consignee and is responsible for the unloading and detention of the cars, it may be a party to an average agreement even though it receives carloads of miscellaneous freight owned by others.[3]

It may be noted that the average agreement does not apply in the case of cars held for reconsignment, nor on cars subject to the bunching rule.[4]

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[3] See I. C. C. Conference Rulings 409, 463, 497.

[4] Except where bunching is caused by strike of carrier's employees or where shipments of coal are withheld by the carrier to protect its fuel supply and are subsequently delivered in accumulated numbers.

Advantage of the Average Agreement.—Undoubtedly, the average agreement gives certain advantages to the larger shippers. A company which has a considerable volume of carload business during the course of a month may appreciably reduce its demurrage charges through credits received on cars which are released promptly. Some have thought this advantage amounts to a discrimination against small shippers. Certainly, the average agreement complicates the handling of demurrage accounts. Many railway men are inclined to think that the arrangement should be abolished, and it must be admitted that the argument for it is not strong. If the demurrage idea is correct and it is desirable to penalize all cases in which equipment is held beyond 48 hours, it does not seem logical to introduce an arrangement by which the penalty can be softened.

CHAPTER XXIX

SOME TERMINAL TRAFFIC FACILITIES AND PROBLEMS

Importance of Terminals.—It is too true, as Mr. L. F. Loree, President of the Delaware and Hudson, says, that "The large terminal stations and the large terminal yards are the graveyards of cars." As cities have grown in size and traffic has become more congested, the "terminal problem" has become second to none in the field of railway transportation. No matter how swift the line haul, if terminal facilities are inadequate, delay and loss may be great.

Practically all the millions of tons of freight hauled by our railways pass through "terminals," where the railways take traffic from the shipper or deliver it to the consignee. It is vitally important both to shipper and carrier that here there should be efficiency. This, however, can come only if there is mutual understanding of terminal problems and cooperation in solving them. No small part of the trouble at present lies at the shipper's door.

In 1919, the total mileage of single track operated by the Class I railways of the United States was 375,424, and of this 104,493 consisted of the yards and sidings. Moreover, between 1915 and 1919 the increase in miles of first main track was only a little over 2%, while the miles of tracks in yards and sidings increased nearly 10%. Together with stations and other terminal facilities, this means an enormous investment in terminals. In 1917 six railways out of some dozen entering New York testified that the assessed value of their terminals at that point was nearly $82,000,000, and at an earlier date the Northern Pacific estimated that $73,000,000 was the value of its terminals in eight cities, out of a total value of right of way and terminals of $107,000,000.

Terminals Defined.—A terminal is "an assemblage of facilities provided by a railway at a terminus or at intermediate points on its line for the purpose of assembling, breaking up and relaying trains." These facilities include yards, industrial and team tracks, piers, stations, warehouses, elevators, roundhouses, and a host of other appurtenances. A "yard" is a set of tracks for the switching or storage of cars—for receiving them, arranging them in trains, or holding them while not in transit. "Industrial tracks" are those serving some particular industry or group of industries; and "team tracks" provide the means of transferring freight directly from cars to the wagons or trucks of the general public.

Switching.—One of the most important and characteristic terminal operations is "switching." This is the movement of cars by a railway between points within a single station and placing them for delivery or receipt of freight.[1]

"Line-haul switching" occurs when a car comes in over a road to be delivered from its yard to some siding within the "switching limits" of a station, or is received at a siding for transportation. "Terminal switching" is the movement of cars between points within the switching limits.

A very important part of terminal switching is carried on between the receiving yards of the railways and the private sidings and industrial tracks of commercial and manufacturing companies.

It is too common for such companies to make inadequate provision in the shape of tracks and platform space for handling their traffic, and this is one of the great causes of congestion and car shortage. It forces the railways to hold an unnecessary number of cars for consignees. If shippers and consignees having their own sidings would make provision adequate to handle enough cars for a day's requirements, including trackage sufficient for easy switching, it would undoubtedly do much to expedite car movement and to prevent congestion in periods of heavy traffic.

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[1] There is also some "line-haul switching" which is switching performed while cars are en route between stations.

Switching may be an intra-plant movement, or one between points on the terminal of a single road, or one between points on two different roads (interline switching) ; but it must usually all be performed within certain "switching limits," which are governed by railway rules and within which a schedule of switching charges applies. This movement may be made by the railway which transports the car to or from the terminal, or by some special local switching road or belt line. Not infrequently, too, the larger industries operate their own switching services.

Industrial Railways and "Tap Lines."—"Industrial tracks" or sidings are not to be confused with "industrial *railways,*" or "industrial carriers." The latter are short railways owned by some industrial concern which they serve, such as a steel plant. They may be common carriers, hauling freight for the public, or they may be mere plant facilities for bringing raw materials and fuel from a trunk line, delivering finished product, and intra-plant switching. The "tap line" is a species of industrial railway, so called because it taps a trunk line, the name being most commonly used in connection with lumber and coal lines. Tap lines are more frequently common carriers than are "industrial railways."

Tap lines and industrial railways are often given an allowance out of the through rate, when they can claim to be common carriers. Obviously there is an opportunity for discriminatory rebating in this connection, and there is a long history of such cases.[2] The Interstate Commerce Commission about 1910 tried to solve the problem by drawing a line between plant facilities and transportation, and by forbidding the payment of rate proportions to the former. The courts, however, have held that the Commission has adequate power over rate divisions to prevent discrimination and that the practice of making allowances to industrial and tap lines which are common carriers, is lawful. If the industrial road is a common carrier, it may be paid out of the transportation rate either by prorating the joint rate, or by absorbing its share as a switching charge. If it is not a common carrier, the matter is one of switching charges, the line-haul road making extra charges per car for extra switching and spotting service, or paying for any switching services rendered by the industrial road which it would otherwise have to perform itself.

Switching Charges.—Sometimes a charge is made against the shipper or consignee for switching service, and sometimes not. When charges are made, they differ widely at different points. In general it may be said that the tariff covering transportation includes the movement from the public freight-house or team tracks at the point of origin to those at the destination, including line-haul switching. Generally, too, if the movement is to or from some private siding or industry, which causes no more expense than is involved in the case of a switching movement to the public terminals, no charge is made. The railways are compelled to regard industrial tracks and private sidings as a part of their public terminals and treat the service to them as similar to that to team tracks. But sometimes the switching service to a siding involves extra expense, and then a charge may be made. The movement may require "spotting" cars at points unusually distant. Also, when a car requires more than one placement for loading or unloading, an extra charge may be collected.

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[2] E.g., Sec. 17 I. C. C. 40; 20 I. C. C. 200; 23 I. C. C. 277; 29 I. C. C. 212; 32 I. C. C. 129; 49 I. C. C. 332; 68 I. C. C. 375; and cases there referred to.

Absorbing Switching Charges.—Again, when interline switching is required, a charge is usually made. The shipper or consignee may not know this, for the carrier which transports the shipment may pay for the switching itself. This is called "absorbing" the switching charge. Thus one may ship a car to New York, billed to a consignee who cannot be reached over the rails of the road which makes the "line haul." That road at the terminal turns the car over to another road which switches it to the consignee and makes a charge for its service. If this charge is "absorbed" by the original carrier, the shipper pays only the transportation rate to the terminal. The practice of absorbing switching charges is general where competition for traffic between the two stations exists among the roads concerned. Obviously if one of the carriers did not absorb the switching charges, the shipper would ship over the other road which could deliver his car direct to the consignee without an extra charge.

When a group of carriers serving a given station all agree to absorb each other's interline switching charges, "reciprocal switching" is said to exist. At Chicago, for example, any carrier will deliver a car on the terminal tracks of any other carrier at the common Chicago rate. Necessarily this means that some roads must absorb more charges than others, and the Interstate Commerce Commission has not looked with favor on the practice. It is, however, undoubtedly a convenience to shippers.

The charge for switching, when made, is either so much per car, or is a flat rate per 100 pounds (say 3 to 5 cents). The per car rate often runs from $1 to $5 per car. It is common to specify that such charges will only be absorbed when the shipment is one of 5,000 pounds or over, and sometimes a certain minimum revenue must also accrue under the through rate, say $8 to $15 per single car. Switching charges are quoted in special "switching tariffs."

Lighterage.—At several great water terminals it is necessary to make collections and deliveries of freight not only by switching, but by "lighterage," that is, by movement on lighters or barges (when the freight has been unloaded from cars) and on carfloats—the latter being large barges on which are tracks for receiving cars. This is true at New York, Baltimore, Philadelphia, San Francisco, Chicago, and a few other points.

As a rule certain limits are fixed within which "free lighterage" is given to some classes of freight. At New York, where the free lighterage limits extend up and down the harbor, a total distance of 26 miles, the railways undertake to deliver carload freight of most descriptions by lighter or carfloat without extra charge.[3] Free lighterage and floatage are also given to carload freight at Philadelphia and Baltimore, when such freight pays the carrier a certain minimum amount (7 to 8 cents per 100 pounds), subject to a minimum quantity.

The lighterage service at New York, at least, costs much more than the amount received by the carriers for the service. On lighterage-free freight, the carriers serving New York deduct 3 cents per 100 pounds from the total through rate before prorating with connecting roads, and they add 3 cents to the transportation rate on freight originating at nearby points. This is only 60 cents per ton, and since it is estimated to cost over $1 to lighter a ton, it is evident that the carriers suffer a considerable reduction in earnings for the sake of maintaining traffic at the port of New York.

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[3] The railways from New England charge extra on deliveries not to their own terminal stations.

Belt Lines.—An important adjunct to modern terminal operation is the belt line. The industries of any city may not be located directly on the lines of the several railways which serve it, but may be scattered so as to secure the greatest advantages as to rents and labor supply. In the latter event, it is highly important that there be adequate means for connecting the scattered industrial plants with the various main lines of railway, and this service is frequently afforded by "belt lines" which switch cars to or from the several carriers with which they connect. Also, it is desirable that freight routed through a station where terminals are congested to some point beyond should be able to pass around without actually going into the terminals.

There are (1) outer, or detour, belt lines; and (2) inner, or industrial, belt lines; and a special type of inner belt line is the water-front belt line. The outer belt lines serve to divert freight from congested stations or terminals, by transferring cars to connecting lines without taking them through the terminals. Their operation is well illustrated at Chicago, where there are four concentric belt lines, and they prevent the unnecessary lodging in the terminals of a large volume of through freight.

Inner belt lines of various types are found at New Orleans, San Francisco, Baltimore, Philadelphia, Indianapolis, and several other points. Sometimes they are owned and operated by the city, as at New Orleans; sometimes the city shares in the ownership, as at Philadelphia; generally they are owned by private companies. They supply a physical connection between all the industries and railways which they touch, thus organizing them into a single great terminal. Shippers reached by an industrial or water-front belt line are benefited by the competition of all connecting railways.

The special significance of the water-front belt line is that it serves to coordinate rail and water transportation. It extends along the water line of a harbor, intersecting the various roads which radiate therefrom, and connecting the piers and wharves. A complete belt line of this type would enable the transshipping of freight and switching of cars from any one railway or wharf to all the others, and would connect the industries located along the harbor front.

What was said about switching charges applies to the charges of belt lines, when they are separately owned and operated. It is to be noted that, unless owned exclusively, and maintained, operated, and controlled by some state or municipality, belt lines are included under the term "carrier" as used in the Interstate Commerce Act, and are subject to the Federal Commission. In line with this fact, the Commission has held that when a carrier or group of carriers owns a belt line, it must deliver to points on that line at the same rate as to its own terminals. In a word, a subsidiary terminal belt line is considered as a part of the terminals of the controlling road or roads.

Importance of Belt Lines.—The importance of belt lines may be briefly summed up as follows:

1. They relieve present congestion.
2. They enable greater freedom and economy in locating industrial plants.
3. They aid in the control of wholesome urban development.
4. They increase the service and decrease the expenses of shippers by extending the rail outlets available to them.
5. They increase the efficiency of ports or harbors both by coordinating all piers or wharves and all rail lines, at the same time bringing the two groups of facilities together.

It may safely be said that the existence of both inner and outer belt lines is vital to any sound plan of port development. New York has managed with very little belt line construction, by the aid of her extensive use of lighterage, but the port is seriously handicapped by the lack of coordination among its harbor facilities through rail connections. Without such connections the rail-water terminals are more or less isolated. They virtually become separate ports. In order to have maximum efficiency there must be port and terminal unity, and to have such unity there must be physical connection among all piers and railways.

The great obstacle to achieving this end has been the natural jealousy of carriers which have secured the better terminals. They have exercised foresight and made large investments, and each desires to retain its advantages. It is believed, however, that this is a shortsighted policy. In the long run the interests of the carriers are interrelated and must run parallel to those of the public. It may be safely predicted that in a short time our great stations will all have a unified and coordinated system of terminals and terminal charges, and that in such a system the belt line will play a leading part.

Trap Cars.—Clearly related to switching is the use of "trap cars," or "ferry cars," as they are sometimes called. Such cars are placed by the carriers on the private sidings of shippers to be loaded with less-than-carload freight. They are then hauled to the freight-house or transfer station, where they are rehandled if necessary, and the shipments contained are distributed for forwarding to their various destinations. A similar service may be given on inbound freight. This service may be performed free of charge if a minimum of 12,000 pounds is loaded. Otherwise there will be a charge of from $2 to $5 per car. The Commission has ruled that trap-car service is unlawful unless given under definite and clear tariff authority, non-discriminatory in terms and application.[4]

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[4] 34 I. C. C. 521.

Such service is often of great advantage both to shipper and carrier. It makes unnecessary the passage of the freight through freight-houses, which are often highly congested. Trap cars are usually placed late in the day and hauled to the station at night, while the drayage of L. C. L. freight becomes most congested between two and five o'clock in the afternoon; consequently the station force and equipment can be better utilized. Shippers can locate at points fairly distant from the station, when they are able to load their L. C. L. freight directly into cars, thus saving in rent and drayage. It may bring a saving in loss and damage to load directly into cars. As a result of trap-car service, carriers can get along with smaller investments in freight-houses.

On the other hand, time may be saved for the shipper by draying, since these shipments generally go forward the same day, while trap-car shipments will generally not move out until the day after.

Store-Door Delivery and Container Cars.—During the war, when freight congestion was especially bad, much attention was given to the subject of "store-door delivery." Of late years, too, the use of "container cars" has been proposed and tried. Singly or together, these two devices hold out great hopes for increased economy and speed in handling freight at terminals. By store-door delivery is meant the delivery of freight by the carrier at the door of the consignee. A container car is one which carries two or more separate and removable containers which can be transferred bodily with their contents to motor trucks. The container car naturally goes with store delivery, but store delivery does not require the container system.

From early times it has been the custom of English railways to include the delivery of less-than-carload freight in their regular service—which is one reason why freight rates in England seem higher than in this country. For a long time the Canadian roads have followed the same practice at Montreal and other points with good results, and for many years down to 1913 store-door delivery was made by railways in Baltimore and Washington. It has recently been adopted in a partial and limited way by the Erie at New York City. Thus it is not an untried theory, but a practical operation.

Container cars are in use by the New York Central and several other roads for certain traffic. Doubtless other experiments are being made.

The Erie Experiment.—At present, the Erie's plan is as follows: The freight to be handled breaks bulk at the receiving yards on the Jersey side of the Hudson River and is transferred to motor trucks or to trailers hauled by tractors. These are then ferried across the river, and either proceed direct to the consignee's warehouse or to an Erie's Manhattan station, as desired. At present the trucking is done under contract by a large New York trucking concern. Outbound freight is handled in a similar way.

This is but a first approximation, and plans for extension and improvement have been considered. The first step proposed is the adoption of a container system at the receiving yards, where bulk would be broken and the freight unloaded into containers about the size of an ordinary truck body and which can be handled economically by cranes. These containers would next be loaded on flat cars and hauled to the waterfront, where they could be transferred by cranes to floats, towed to Manhattan, transferred by cranes to trucks, and delivered.

This method would be but transitional. The proposed plan called for a second step, which would require the construction and use of container cars. This step would eliminate the transfer to flat cars at the yards, since the container cars would be hauled to the pier and the containers would then be loaded directly on floats and so be ready for transfer to trucks for delivery to the consignee or the inland freight-house. There would thus be no breaking of bulk, but freight might be loaded into a container and shipped through to the consignee without further handling, other than by crane from car to float, and from float to truck. Where floatage is not involved, the process would be even simpler.

Objections Raised against Store-Door Delivery.—Why, then, has store-door delivery not made greater progress? Chiefly on account of inertia and the opposition of separate trucking interests. On the one hand, the railways have dreaded the extra liability and trouble involved in taking over the collection and delivery of goods at their terminals. It was found at Washington that, as the city grew, greater demands for distant and inconvenient deliveries were made, without increase in compensation. Some carriers have not desired to assume the liabilities of truckmen in addition to those they now bear.

Naturally enough, the smaller trucking companies, fearing the loss of an important part of their business, have brought opposition. Also large concerns equipped to do their own trucking, such as wholesale grocers, have objected, saying that they prefer to do their own hauling and can do so more cheaply than the railways.

Advantages of Store-Door Delivery.—On the other hand, the advantages are:

1. Relief of congestion of terminals and streets. A more orderly system of deliveries (and collections) could be adopted with fewer needless and overlapping hauls. A large volume of freight would not need to pass through freight-

houses. The freight-house facilities required would be minimized and the same platforms could be used for both inbound and outbound freight.

2. More expeditious movement of freight.

3. Great economies in handling by centralization and elimination of duplications. It would certainly enable a more continuous utilization of trucks. When each merchant and manufacturer does his own trucking, twice as many trucks may be required to serve a single block as would be required if the carriers did the work.

Store-door delivery is a special service in the nature of a "privilege," and in the case of Baltimore and Washington the Interstate Commerce Commission held that the carriers were under no obligation to give such service.[5] If, however, it should become recognized as a public necessity, legislation requiring it might hold. It seems that the gains far outweigh the losses, and if we can assume a fair allowance for compensating the carriers, there is no valid long-time objection. It might be wise to allow firms which desire to operate their own trucks to do so, as is the practice in Canada, but this condition should be transitional, as it might allow considerable duplication of service and facilities.

Advantages and Disadvantages of Container Cars.—As to the container car, its use has certain limitations. It would require large first cost for equipment and devices for handling the heavy containers. There are important commercial difficulties, such as the necessity of accepting goods on the basis of "shipper's load and count," and the difficulties of handling the collection of freight charges. Some freight is too long to load in containers. But these difficulties are merely limitations on the use of containers. The system could be used to advantage for many kinds of freight and express, and it might be installed gradually at certain terminals and as new equipment is required. The New York Central has tried the system for express between New York and Chicago, and for freight between Chicago and Cleveland; also in hauling shoes on the Boston and Albany.

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[5] 30 I. C. C. 455.

The advantages of the container system are these:

1. It saves breaking bulk at terminals and unnecessary handling which is so burdensome in the case of short-haul L. C. L. freight.
2. It minimizes the amount of packing required.
3. It reduces damages due to rough handling.
4. By enabling a shipment to remain locked in a container all the way from shipper to consignee, it eliminates theft.
5. It saves trucking and demurrage.
6. Tallying and checking are reduced.
7. The car trucks (running gear and platforms) can make a greater mileage through more continuous use. Container cars can be loaded and unloaded in a fraction of the time required for filling a box car by hand trucking.

It seems to the author that store-door delivery is bound to come soon in certain large and congested stations, and that the container car will find a limited use for certain classes of traffic of the semi-express type and possibly for more general use at those points where store-door delivery is required.

Elevator Service and Storage.—We will only touch on two other terminal services, namely elevation and storage. Elevator service is a part of transportation and carriers are bound to provide it. It is common for railways which handle grain to store it in elevators, either their own or those belonging to outside concerns. At such terminals as Boston, New York, Philadelphia, and Baltimore, the railways own large elevators.

In case a carrier employs commercial elevators it may make reasonable and non-discriminatory "allowances" for their services, such allowances being subject to the regulations of the Interstate Commerce Commission or State Commissions, according to whether the traffic is interstate or intrastate. It is to be noted that the elevator allowances referred to concern grain only in process of transportation. They do not apply to commercial elevator service such as cleaning, drying, weighing, and storing grain, though the railways may also perform these commercial services at fair rates. At the seaboard terminal elevators, the charge for handling grain is generally .9 of a cent per bushel, covering elevation, storage, insurance, and spouting into the ship; but at some points where insurance is not included the charge is .75 of a cent. At such points the elevators are at the piers.

In New York, where such is not the case, and the grain must generally be lightered to ships, floating elevators are employed to transfer it from barges to the ship's hold, for which service the companies which operate the floating elevators charge .9 of a cent per bushel, the railways making no charge for their elevator service and giving "free lighterage." As shippers sending grain via New York can thus reach any ship in the port, instead of being confined to such ships as may be available at the piers of the terminal receiving the grain, and consequently can secure the promptest sailing and minimum ocean rates, New York has an important advantage for this traffic. The New York railways, however, must work on a very narrow margin as a result of giving free elevation and lighterage.

Charges for Storage.—To some extent, storage charges, like demurrage,[6] are penalties designed to hasten the movement of freight from the terminals and prevent congestion; but in the main they are to be regarded as payments for special services rendered by the railways—the privilege of using their terminal premises for warehouse purposes. When freight is left in the carrier's possession beyond a specified "free time," it is stored as a warehousing service. For this service the carrier charges on most ordinary classes of freight are 1½ cents per 100 pounds for the first five days, and for the sixth and each succeeding day, 3 cents. "When carload freight is unloaded by the carrier for the purpose of releasing needed equipment, the storage charge will be the same as would have accrued under car demurrage and track storage rules [7] had the freight remained in the car."[8]

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[6] See page 476.

Railways have the right to remove freight from their premises and store it in public warehouses at the owner's risk and expense, as provided in their bills of lading.

Joint Use of Terminals and Interchange of Traffic.—The foregoing pages of this chapter serve to emphasize the importance of terminals and terminal service, and they show that both carriers and shippers must help by making adjustments in their methods and by cooperating, if the best terminal usage is to be attained. Also, it will probably be necessary for some government pressure to secure the necessary sacrifice of shortsighted special interests. We shall, therefore, conclude this chapter with a few words on the legal situation and public regulation.

Two Phases of the Terminal Problems—Adequacy of Terminal Facilities.—To begin with, there are two distinct phases of the terminal problem, one concerning the adequacy of the combined facilities of the railways, taken as a whole, throughout the nation or at some particular station; the other concerning the better utilization of existing terminal facilities through coordination or combination. Concerning the former there is little to say. If it should become clear that the terminal facilities are inadequate, the Interstate Commerce Act provides that all carriers engaged in interstate commerce shall, if able, afford "all reasonable, proper, and equal facilities for the interchange of traffic between their respective lines, and for the receiving, forwarding, and delivering of passengers or property to and from their several lines and those connecting therewith" (Sec. 3). Under this provision the Commission could compel the installation of adequate terminal facilities in so far as the financial ability of a carrier allowed.

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[7] See page 476*f*.

[8] **Storage Charges and Rules: Rule 5, Sec. C. A complete set of rules and** charges which are uniform for most carriers is published by the American Railway **Association Tariff Bureau, Chicago.**

It is not clear, however, that there is at present any general inadequacy in physical terminal plant or service. Rather the need of the hour is for the better use of the existing plant.

Coordination of Terminal Facilities.—This second phase of the terminal problem has two aspects: the interchange aspect and the joint-use aspect. The interchange of freight between railways involves the subjects of physical connection between lines and the through routing of traffic over connecting lines, and the Commission has great power over both matters. Upon the application of any lateral, branch line, or of any shipper tendering interstate traffic for transportation, common carriers subject to the Interstate Commerce Act must provide and operate on reasonable terms a switch connection, if such connection is practicable and safe and will furnish compensatory traffic (Sec. 1, par. 9). This is true even at "closed" terminals where a carrier has not opened its terminal facilities to any other lines. Also connection between docks and railways can be compelled (Sec. 6, par. 13a). The shipper's right to designate routing, backed by the

Commission's general power to establish through routes and its special power to direct the handling and routing of traffic in emergencies," [9] may further control the interchange of freight.

It will be observed that not every shipper or railway can come to a line and compel it to lend the use of its terminal facilities by interchanging freight. There are certain "ifs." The connection must furnish sufficient business to justify construction and maintenance. In the past, too, the Commission has been against doing anything to compel a carrier to "short-haul" itself, and it denied the request of the Jersey cities which sought to compel the lines entering New York to adopt reciprocal switching tariffs [10] which would make one road switch a car for a mile or two only to transfer it to a competing road to haul to a destination reached by both. Also, not every road which seeks a connection may be a "lateral, branch line" under the Act. The purpose is to insure to shippers the outlets they need, and the Commission may not aid a line (perhaps an electric line) to force its way into a terminal built up and already well served by older lines. It will not aid merely acquisitive competition, and the addition of more competing lines will not be regarded as necessary where facilities are adequate.[11]

Doubtless the question of discrimination plays a part here, and if a carrier interchanges traffic or does switching at its terminal for one road, it will probably be compelled to do so for others if the refusal to do so results in unfair discrimination.

Power of the Commission over Terminal Matters.— The original Interstate Commerce Acts, in so far as terminal relations are concerned, dealt almost entirely with the interchange relationships discussed in the preceding paragraphs; but the present law takes a long step in the direction of providing for the joint use of terminals (as by trackage rights). Thus the Commission may "require the use of any terminal facilities, including main-line tracks for a reasonable distance outside of such terminal, of any carrier by another carrier or other carriers," and may fix reasonable terms (Sec. 3). Moreover, if the Commission thinks that any emergency requiring immediate action, such as congestion or car shortage, exists in any section of the country, it is empowered to require the joint use of terminals (Sec. 1).

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[9] See page 327.

[10] See page 488.

[11] 13 I. C. C 20.

These are broad powers, but certain wise limitations are contained in the Act. In the general, or non-emergency paragraph, it is set forth that the Commission must find the joint use to be (1) in the public interest, (2) practicable, and (3) without substantial impairment of the possessing carrier's ability to handle its own business. Moreover, in fixing compensation, the terms must be just and reasonable, and be ascertained on the principle controlling condemnation proceedings, which insures due recognition of the value of the use. Indeed, the value so determined would be so great in the case of many terminals that we may be sure that joint use will not be lightly sought. As to compulsory joint use in emergency, it remains for events to show how elastic the term ' emergency" will prove. Certainly it would cover any serious congestion which threatened to be of long duration at a point such as New York. How long a period may be covered by an emergency?

"Emergency" Powers Likely to be Most Important.— It is not unlikely to develop that the emergency provision is the more important of the two. The courts will undoubtedly protect the interests of the owners or occupiers of terminal properties, and will not support any compulsion of joint use, not required by social emergency, which would deprive them of property rights without full compensation. And if granting joint use of a terminal would destroy the competitive power of a carrier, what would be the value of the sole use of that terminal to it? It might represent in an extreme case the entire value of the road. As already observed, a railway's investment in a terminal may represent great foresight and risks, as well as a certain first cost. Then there may be an element of "unearned increment" in some cases, about the loss of which we may be less concerned, but which nevertheless under our past and present customs has been allowed to belong to owners. Under condemnation proceedings it is the "value" of the use, not the cost of the investment in the property, that must be paid for, and such value—even if restricted to that which might reasonably have been anticipated by business foresight—would often be enormous.

Summary.—In this chapter we have seen how important are railway terminals, and something of the variety and significance of the services performed by carriers at such terminals. Some terminal facilities are in the nature of special privileges which the carrier is not required to furnish—except that if offered to one shipper they must be given to all. Others under our law are an essential part of the transportation service and must be provided as required. The Interstate Commerce Act says that for its purpose the term "railroad" shall include carfloats, lighters, and ferries operated in connection with any railway, and also switches, spurs, tracks, and terminal facilities of every kind necessary in transportation. The term "transportation," in turn, covers all services in connection with the receipt, delivery, elevation, storage, and handling of property transported. The various terminal services are subject to rules, regulations, and charges which are available in published form, and every regular shipper or traffic man should be familiar with them. We have merely sketched some of the more important points, describing briefly the nature of the service charges and pointing out some of the rights and duties of carrier and shipper.

The nature of the terminal problem should now be fairly clear to the reader. It is one of the very greatest and most pressing problems in transportation today. It seems clear that it lies chiefly in securing a better coordination of terminal facilities. Yards and tracks, freight-houses, elevators and lighterage facilities can be coordinated through a wise joint use and by interchange of traffic. The construction or extension and combination of belt lines will do much to assist the coordination of existing facilities. At the most congested points the adoption of store-door delivery will save great waste and expedite the movement of traffic. To some extent improved arrangement and devices will help—better yards, freight-houses, and equipment; the adoption of the container car for certain kinds of traffic.

On their part, the shippers can do much by such means as loading promptly and properly cars, in routing, and doing their share in providing trackage and platform space at private sidings and industrial tracks. Their cooperation is required for the successful introduction of store delivery and container cars.

One of the chief grounds for anticipating improvement in transportation in the near future lies in such developments. With our great terminals mobilized and working as units, congestion and car shortage would largely disappear.

In conclusion we may note with approval the following statement made before the Interstate Commerce Commission in the *New York Harbor case* (1917):

> The essential defect of the country's railroad system is the great cost of terminal handling as compared with the

economy of hauling the trains, and nowhere is this defect more in evidence than at New York. Defective city terminals throughout the land must be enlarged, modernized and integrated. At each city, as in the cities of Europe, the terminals will come to be conducted as administrative units.

These changes of policy involve vast expenditures which can only be recouped by terminal service charges, and consequently there must be substituted for the old-fashioned practice of individualistic competing terminals a modern policy of terminal integration and a segregation of terminal charges from hauling charges.[13]

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[13] 47 I. C. C. 734.

CHAPTER XXX

FREIGHT CLAIMS

The Great Importance of Freight Claims.—In recent years, sums in the neighborhood of $100,000,000 per annum have been expended by the railways of the United States in settlement of claims made by shippers for loss and damage to freight. This amount has been equal to about 2% of the total operating expenses of the railways. In short, it is large enough to turn the scale between profit and loss very decisively.

In 1921 over 2,630,000 loss and damage claims were presented against the carriers, and nearly $97,000,000 was paid. An active campaign among the railways by education and supervision to reduce their losses from this source resulted in decreasing the number of claims to 2,351,000 in 1922, while payments fell to $48,085,000—a remarkable achievement which it is to be hoped will be made permanent.

Moreover, the subject of claims is one that causes much friction between shipper and carrier, which is very undesirable. Most students of the subject will agree that much of this friction could be eliminated if there were in the minds of both parties an understanding of the processes involved and of their mutual duties and obligations. It is with this thought that the following chapter is written.

The Carrier's Liability for Loss and Damage.—If a group of laymen were asked the following question, it is probable that decided difference of opinion would develop: "If an automobile being transported in a box car is pierced by a bullet fired by an unknown party while the train is rolling along between Detroit and New York City, who is liable for the damage?" Yet there is only one answer to the question —the railway company. At common law a "common carrier" is liable for any and all loss or damage to freight which is being transported by it, unless such loss or damage is caused by an act of God, the public enemy, the fault of the shipper, or by some inherent weakness in the goods shipped. This makes the carrier responsible in all ordinary cases—and also in many extraordinary ones, as illustrated by the foregoing question.

The correct way to regard the subject is to consider that a contract has been entered into between shipper and carrier, under the terms of which the carrier agrees to deliver the goods safely at their destination. Under this contract the railway must not only (1) haul the goods, but (2) must do so at the published rate, and (3) deliver the full quantity,[1] (4) in the same condition as that in which they were received; and (5) this it must do within a reasonable time. If it fails to live up to its part of the contract, it must recompense the shipper to the extent that his shipment is lost or damaged, or to the extent that he is overcharged. Damages, however, are limited to those which are the natural and proximate result of the carrier's breach of contract.

Under the Interstate Commerce Act a carrier engaged in interstate commerce cannot avoid liability for the "full actual loss, damage, or injury . . . caused by it . . ." Some states also have enacted laws which provide that no contract or rule shall exempt any railway corporation from the full liability of a common carrier.

Four Classes of Freight Claims.—A freight claim is a demand filed by a shipper of a right to recover from a carrier for loss of or damage to freight, for unreasonable delay in transportation, or for the collection of erroneous charges. There are thus four great classes of freight claims:

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[1] But carrier is not responsible for natural shrinkage.

1. *Claims for loss.* Such claims may be for—(a) "known loss," that is, physical loss which is evident at the time of delivery by the carrier or which is known by the carrier's complete failure to make delivery; (b) "concealed loss," which is physical loss that is not known until after the consignee has opened the container and checked its contents;

2. The second great class of claims consists of *damage claims.* These may be either (a) "known damages" or (b) "concealed damages." ("Damages by delay" are also distinguished, arising from deterioration or spoilage due to unreasonable delay in delivery. Apparently these may be either "known" or "concealed," as in the case of damages due to accident or rough handling.)

3. Claims for loss by *delay,* are based on changes in price or expense incurred during a period of delay, to the injury of shipper or consignee. Economic loss is involved rather than physical loss or damage.

4. The fourth kind of claims consists of *overcharge claims.* Such claims all involve the rate that is charged. The overcharge may come about in several different ways. The shipment may be given the wrong class, or rating; it may be given the wrong rate, either through error in quoting the tariff or through faulty routing; it may be given an erroneous weight; or there may be an error in computing the total amount. Whatever the cause, however, the essential feature in the overcharge claim is that it concerns the rate and not loss of or damage to the goods shipped.

Kind of Traffic Most Affected by Loss and Damage.— It is important to consider in detail the nature and causes of loss and damage to freight. First, let us note the kind of freight which is found to be most subject to loss and damage. During the single month of September, 1920, 43 large railways paid the following loss and damage claims:

Clothing, dry goods, and notions	$620,000
Fresh fruits and vegetables	577,000
Grain	279,000
Tobacco, cigars, and cigarettes	241,000
Boots and shoes	217,000
Furniture (new)	210,000
Livestock	186,000
Meats and packing-house products	154,000
Automobiles, trucks, and accessories	153,700
Household goods	77,000
Eggs	63,000

It is obvious that this list consists chiefly of two great classes of goods, namely, those which are especially liable to pilferage and those which are perishable or easily damaged by handling. Clothing, dry goods, tobacco products, and boots and shoes are notably liable to theft; while fresh fruits, meats, and eggs are easily spoiled or broken. In 1921 the carriers paid claims on fruit and vegetables alone amounting to $14,500,000. Grain, while fairly liable to loss on account of defective cars, stands as high as it does in the list chiefly because of the relatively large tonnage which is handled.

An important point to understand is that less-than-carload freight furnishes a relatively large proportion of loss and damage claims. The total tonnage hauled by the railways in carloads is somewhat over 75%, but the proportion of loss and damage claims paid on carload shipments is only about 50%. This is illustrated by the experience of 165 railways in the month already mentioned, September, 1920. They reported $3,500,000 paid in loss and damage claims on less-than-carload freight, and only $3,200,000 on carload freight. The reasons for this situation are fairly clear, since less-than-carload freight not only comprises a relatively large proportion of finer merchandise, but is also subject to more frequent transfer and handling.

A recent report of the Southern railway covering the first six months of 1922 illustrates the foregoing points. The facts speak for themselves.

Flour	No. of Claims	Amt. of Claims	Revenue Earned	Percentage of Loss
Carload	827	$14,401	$106,055	13.58
Less Carload	945	7,427	14,655	50.68

Causes of Loss and Damage.—A study made by the Illinois Central in 1922 showed that by far the largest percentage of loss and damage claims is caused by carelessness of one sort or another. The study showed that approximately 32% of the total was immediately caused by rough handling, 15% by defective equipment, 11% by delays in transit, and 10% by loss of packages—these causes alone covering 68% of the total. The railway was able, by greater watchfulness of its special agents, to make a great reduction in thefts, which in three years had numbered 12,000,000 and had necessitated total payments of claims amounting to over $395,000.

Rough handling of cars was the cause of 16% of the loss and damage expenses reported to the freight claim division of the American Railway Association in the first quarter of 1922.

The chief causes of loss and damage are contained in the following list:

Rough handling.
Bad packing.
Bad loading.
Defective cars.
Careless inspection of cars.
Delay in transit.
Theft (before, during, or after transit).
Dishonesty of consignees or railway employees.
Inadequate protection of perishables.
Misrouting.
Faulty marking.
Car shortage.
Shipping to oversupplied markets (especially perishables).
Refusal of goods by consignee.

- Delivering freight to other than consignee without the latter's order.

A cursory reading of the foregoing list will show one that the human element in loss and damage of freight is large. Indeed, it may be estimated that not over 10% of the loss and damage to railway freight can be traced to causes beyond human control; and it follows that by education among shippers and railway employees, and by more careful supervision, a large part of the losses could be eliminated.

Preventing Loss and Damage.—Often the trouble could be easily avoided. For example, take the case of a shipment of ten cases of fine machinery from Milwaukee to Memphis. Nine of the cases were marked; one was not. The car containing the shipment went through Cairo, where its contents were transferred, the nine marked cases going through to Memphis, while the one not marked was held. It was put away and forgotten, and in due course a claim was presented and paid on the ground that the shipment was one case short. One of the greatest accomplishments of the railways in 1922 was by education and supervision to reduce claims for "unlocated loss of entire packages" from $13,173,000 to $5,026,000.

Or take the case of a $2,500 type-setting machine, shipped from a middlewestern point to New York. It was both improperly crated and insecurely loaded, and, to make things worse, the car was roughly handled by the trainmen. As a result, when it reached its destination, the machine was not worth unloading, and a claim for its full value was presented and paid. Such loss might have been prevented if the shipper had attended to the proper packing, or if the agent at the shipping point had insisted on having the machine properly crated (and charged the expenses on the waybill as advances), or if the trainmen had handled the car carefully. "Rough handling" continues to be the most serious and perplexing problem in the campaign to reduce loss and damage claims.

All too frequently, a consignee finds his shipment short on account of theft while the goods are in transit. For example, a wholesale grocer may discover that his employees are reporting each car of flour short by eight or ten barrels, and on investigation ascertain that the railway's employees or his own, or both, are obtaining free flour by marking up a loss that does not exist.

"Shipper's Load and Count."—When a car is loaded by the shipper, and the carrier's agent does not tally the contents, it may be accepted for transportation and the bill of lading be endorsed with the words, "shipper's load and count." These words do not deprive the shipper of his right to redress for shortage in delivery, but they do shift the burden of proof. Under these circumstances he must show conclusively that the goods were actually loaded into the car. Naturally the carrier is not responsible for damage due to improper loading in this case. The shipper who accepts responsibility for load and count should use great care in stowing and tallying his goods and make a full record of them to meet questions on the part of carrier or consignee.

Preventing Misunderstanding between Shipper and Carrier.—On receipt of goods an immediate inspection and notification of loss are desirable. In the case of known loss or damage the facts should be endorsed on the freight bill by the carrier's agent on delivery. Any shortage which appears during the unloading of a car should be reported at once to the agent. Or if there is any sign that a package has been tampered with, there should be a joint inspection by a representative of the carrier and the consignee. A concealed loss or damage should be reported to the agent immediately, and an opportunity be given him to make an inspection. An intelligent observation of the Golden Rule will be found to be good business. When the freight claim agent can feel that a shipper is filing only just claims, he will naturally have confidence in the claims made by that shipper and will pay them more readily.

Much misunderstanding exists concerning the correct policy to pursue when a shipment is received which is affected by loss, damage, or overcharges. The consignee should be careful not to give a clear receipt when any package is not delivered, or checks short, or is in bad order; but the weight of authority is in favor of accepting delivery even when the goods are damaged and the responsibility for that damage is not settled. *Acceptance of a damaged shipment does not hurt the consignee's claim.* The best practice is to use every reasonable means of minimizing the damage, by repairs, etc. Only when goods have lost all value should the consignee refuse to accept them, and then he will sue for their entire value. When there is a partial damage due to depreciation in value of the goods caused by delay, the general rule is that the consignee must accept the goods and recover his loss in an action at law.

Filing Claims.—A claim may be filed by either consignor or consignee, depending upon which has the title to the shipment involved. The claim should be filed as soon as possible. The Transportation Act provides that it shall be unlawful for the carrier to require less than ninety days for giving notice of a claim or less than four months for filing it. A period of two years is provided within which a suit may be instituted after the carrier has given written notice disallowing a claim. In accordance with these provisions, the uniform bill of lading adopted by the carriers provides that claims for loss or damage must be made in writing within six months after delivery of the property (or nine months in the case of export traffic).[2] This is in case the loss or damage does not occur while the shipment is being loaded or unloaded, or is not damaged in transit by the negligence of the carrier. In such cases no notice or filing of claims is required as a condition of recovery.

Suits must be begun within two years and one day.

In theory, loss and damage claims should be filed with the initial carrier when more than one road is involved, since it is logical to deal with the one issuing the bill of lading. But one may get better results by filing with the agent of the delivering carrier.

Overcharge Claims.—Overcharge claims, however, are logically filed with the carrier which collected the charges. Claims filed with the destination carrier are generally best submitted to the agent who made the delivery, but may be sent direct to the freight claim agent. As already noted, overcharge claims differ from loss and damage claims in that they involve tariffs or rates. In 1924 an amendment to the Transportation Act was passed which fixes the time within which claims for overcharge must be filed at three years, which is the same time limit as applies to actions by carriers to collect undercharges. Under the terms of the amended act, either action at law or complaint filed with the Commission, for the recovery of overcharges, must come within three years from the time the cause of action accrues, i.e., from the time the shipment was delivered or tendered for delivery by the carrier. Certain extensions are made in case of claims filed with and disallowed by a carrier, and in case action is begun by the carrier to collect charges or the carrier actually collects charges on the same shipment.

Supporting Claims.—Too frequently, claims are not properly supported, and this causes delay or even failure to secure a settlement. In order to secure the best results, the claimant should use the standard forms approved by the American Railway Association and by the National Industrial Traffic League. Since these forms cover all necessary points, such a course insures expedition. This is especially desirable in case of concealed loss or damage. In these cases, the forms provide for a shipper's certificate covering the handling of the shipment to the carrier's warehouse, a consignee's certificate covering the handling of the freight from the receipt at destination till unpacked, and the inspection of the shipment by the carrier's representative and consignee.

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[2] In case of non-delivery the period is six months after a reasonable time for delivery has elapsed.

The papers required for properly supporting a claim are: (1) the original bill of lading, (2) the freight bill, (3) the original or a certified copy of the invoice, and (4) an itemized bill for cost of repairs or a sales account where these are appropriate. Naturally a claimant hesitates to give up the original bill of lading, but it should be remembered that this paper shows his right to recover and contains notations essential to passing on the claim. Moreover, it insures the carrier against duplicate payments of claims. It is sufficient protection to the claimant to retain a copy of the bill of lading.

Basis for Determining Amount of Carrier's Liability.— The basis for determining the amount of the carrier's liability is the value of the property at the place and time of delivery. The uniform bill of lading formerly provided that settlement should be on the basis of the value of the property at the place and time of shipment. But in 1921 the Supreme Court ruled in the case of the *Chicago, Milwaukee, and St. Paul Railway v. McCaull-Dinsmore Company*, that destination value should govern.

When goods are lost in transit, in addition to his claim for the value of the lost freight at destination at the time it should have been delivered (less transportation charges), the shipper should claim interest from the time the freight should have been received.

It may be noted that it is the policy of the law to impose upon the consignee the obligation to reduce as much as possible the loss for which the carrier must respond. Reasonable cooperation and good faith on the shipper's part are desirable. The fact remains, however, that when goods are damaged in transit the carrier is liable for the full difference between their value as received and their value in good condition. When the claim involves loss or damage by delay, the basic factor is the normal or customary time during which the goods should have been in transit. A common carrier is not an insurer against delay, and when there is no special contract binding it to deliver within a specified time, a railway is not liable for damages from mere delay in transportation.

It is, however, the duty of a carrier to make shipments with reasonable dispatch, and the law implies a contract that goods accepted for transportation shall be delivered at destination within a reasonable time. Accordingly, if the time consumed is unusually long, the presumption will be that it is unreasonable, and the burden of proof will be on the carrier. Otherwise, the claimant will have to prove that the delay is due to the carrier's negligence. Delay due to weather and conditions beyond the control of the carrier cannot be considered unreasonable. The carrier, however, is bound to advise the shipper as to conditions reasonably within its knowledge which would cause delay, such as congestion at a connecting point.

Determining Loss by Delay, and Overcharge.—The measure of loss or damage from delay is the difference in value of the shipment at the time of actual arrival at destination and what the value would have been had the time in transit been a customary or reasonable period.

The amount of a proper overcharge claim is the difference between the correct rate applicable at the time of shipment and the rate actually paid, plus interest on the amount of the overcharge. Such interest accrues from the date of the collection of the charge by the carrier.[3]

Overcharges which arise from the shipper's own error cannot be refunded by the carrier. Thus, when a shipment of structural iron was made with the intention of having it fabricated in transit, and the shipper failed to note on the bill of lading that the in-transit privilege was desired, the Interstate Commerce Commission ruled that the higher charges which accrued as a result of the shipment not receiving the in-transit privilege was due to the shipper's error and could not be refunded.

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[3] It is unlawful for a claimant to accept a refund without interest. Conference Ruling 489.

Part VI—Government Regulation in the United States

CHAPTER XXXI

PUBLIC RELATIONS AND REGULATION; THE TRANSPORTATION ACT OF 1920

Fundamental Facts.—In approaching "the railway problem" and the study of government regulation, it is essential to keep in mind two fundamental points: *first*, the operation of railways is a business; and *second*, the railways are public utilities and the railway business is "affected with a public interest." It is the failure to recognize the truth of *both* these statements and to harmonize them, which is responsible for a large part of the mistakes which have been made in dealing with the railway problem.

Railway Transportation a Business.—First, then, railway transportation is a business. In these days of increasing government regulation and talk of government ownership, we are too prone to forget this fact. Business is buying and selling for gain, and railways buy the means of transportation (labor, fuel, equipment, and supplies) and sell transportation service (ton-miles and passenger-miles) for the purpose of giving a profit to investors in railway securities.

The fact that the railway business is subject to rate regulation and to enforced publicity does not take it out of the category of business enterprises. Suppose every grocery store were compelled to sell groceries at fixed prices, and were required to make reports as to operating expenses and net earnings. It would still be true that the individual grocers would have a chance to make varying rates of profit according as they bought their goods cheaply and conducted their businesses with efficiency in merchandising. They could still use enterprise in adopting new devices, perfecting organization, and efficient advertising and selling. Undoubtedly, the field for initiative would be reduced and the risks and problems of the business enterpriser would be modified, but the grocery store would still be a business. Business does not depend upon secrecy nor even upon competition in prices. The essential thing is that goods or services are bought and sold with the idea of gain and that success is determined by the ability to show a net gain over a period of time.

The fact is that nowadays practically all industries are, to an increasing extent, subject to government regulation, federal, state, or local. The Sherman Anti-Trust Law and the Clayton Act deal with various "restraints of trade." The Federal Trade Commission Act is an attempt to prevent unfair competition. Blue Sky Laws deal with the issuance of securities. Building ordinances, factory inspection laws, and sanitary measures everywhere restrict business. Nevertheless, the industries affected by such regulation are still essentially businesses and are generally so regarded.

Social Justification of Business.—The social justification of business is that in seeking gain business men are led to put goods or services which are desired on the market, thus making available the consumption of things which people want. If honestly and wisely conducted, business tends to insure that consumers will get what they want when and where they want it. In the long run, business men find gain by supplying the wants of society with efficiency, and centuries of experience have failed to show any equally satisfactory way of accomplishing this end. In most industries, the spur of profits has proved thus far to be the best incentive to the efficient supplying of goods and services.

Politics or government is vastly different from business. It is desirable that a government should be run on an economical basis, but the end of government is not economic.

If we want the railways operated efficiently, supplying us with transportation at the lowest cost, we must allow their policies in the largest possible measure to be determined by business considerations. This would be true under government operation. But if the construction and operation of railway systems were determined by votes and political considerations, experience in the United States shows that we might expect to see the influence of log rolling and the pork barrel. Railways would be built where votes would be gained and taxpayers would foot the bills.

Essentials of a Business Basis.—If we are to keep railway transportation on a business basis, we must take care to preserve certain essentials of business in the construction and operation of railways. Among these essentials, the *first* is initiative. In order for a business to exist, there must be a reasonable amount of initiative, and if every policy were to originate with the government, there would be no true business enterprise in the management of railways. In the *second place,* there must be reasonable elasticity in the conduct of railway affairs in order that the transportation service may be supplied when and where it is demanded. In the *third place,* in the running of railways necessary costs must be allowed for and rates be encouraged which, wherever possible, are sufficient to cover costs; for in this way only can we prevent the economic waste which comes when services are sometimes furnished at a loss and other times at a disproportionate profit. The railway business must be allowed to operate with profit in order to insure initiative and progress and to attract and hold the large amounts of capital which it requires.

In short, within reasonable limits, the laws of supply and demand must be allowed to apply to the railway business, and this means that it must be recognized that none of us, whether he be a professor or a labor leader or a senator, has the omniscience which would be required to determine when and where railway facilities should be supplied, what expenses should be incurred, and what rates should be charged. To the utmost extent which is consistent with the public utility aspect of railway transportation, we should strive to preserve the business element which still remains in the conduct of our railway companies. There is danger that business will be driven out of our railways, but there is still a chance to preserve it.

The Railway Business a Public Utility Business.—The foregoing paragraphs have been written with a full recognition of the fact that businesses differ in their relations with the public. From the jewelry business to a water and light company is a far cry. The railway stands in the list of businesses in which the public has a vital interest. The reasons for this fact are now well known and generally admitted.

Legal Grounds.—Some of these reasons are recognized in law. Thus the railway is a "common carrier"; as such it performs a sort of public office and in offering transportation to all it assumes the obligation of supplying equal facilities. The law speaks of the railways as "public highways," meaning that they perform functions of the state in establishing and maintaining the highways, by means of which the parts of the state preserve their intercommunication. In view of their being public highways and common carriers, railways receive certain "franchises," that is, powers which belong only to the state itself. Among these are the right of eminent domain, under which they may take private property for public use; the right to take tolls, meaning fees which are not based on competitive value; and the right to be a monopoly.[1]

Economic Grounds.—To the economist, however, the essential reason for the peculiarly intimate relation between the railways and the public lies in the economic characteristics of the business, the chief ones of which are: (1) that railway transportation is a natural partial monopoly, and (2) that there is a large element of "joint costs." Other businesses supply goods or services which are vitally essential to the public, as for example, steel, coal, and milk. The difference is that the iron and steel, bituminous coal, and milk businesses are such that competition in price can work satisfactorily, and costs of production can be determined specifically for each unit of product. This, we have seen, is not true of the railway business.[2]

Summary Statement Concerning Public Interest in Railways.—To sum up, direct competition in railway rates does not work; costs of particular railway services cannot be determined; railways perform functions which from time immemorial have been recognized as the duty of the state. Efficient and non-discriminatory transportation service is vital to society, much as the circulation of blood is to the animal organism. Consequently, the construction and operation of railways are among those matters which are of peculiar importance to society and concerning which it is peculiarly necessary that the members of society should be protected from discrimination. We can get along without jewelry and golf clubs; we can find substitutes for numerous items of food and clothing; but our public highways must be maintained and our common carriers must furnish their services on equal terms.

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[1] See above, page 199*f.*

[2] See page 177*f.*

The railways, then, are public utilities and are affected to a high degree with public interest, but they are, at the same time, businesses, and should be run on a business basis. Fortunately, it is possible to allow some public functions to be performed in such a way as to retain the motives which tend to reduce cost to a minimum.

The Need of Railway Regulation.—As times change, the kind of railway regulation most required also changes, but there are certain phases of the railway problem which are generally with us. Among the earliest and most continuous occasions for regulation have been discrimination in rates, and the need of maintaining a fair general level of rates. The question of safety is also an old one. The following list of points will serve to sum up the chief transportation matters which are the object of regulation at the present time and which will probably remain so:

1. Discrimination in rates:
    (a) Discrimination among persons.
    (b) Discrimination among places.
    (c) Discrimination among commodities.
2. Excessive or inadequate general level of rates.
3. Safety of travel (locomotive inspection, grade separation, automatic train control, steel passenger coaches).
4. Finance (valuation and security issues).
5. Supply of transportation facilities:
    (a) New construction and abandonment of line.
    (b) Car supply.
6. Service:
    (a) Terminals.
    (b) Car service.
7. Relation between shipper and carrier (carrier's liability).
8. Labor relations.

9. General public policy (enforcing the social point of view by various means; illustrated by rate adjustments to diffuse industry, measures to help solve the coal problem, etc.)

Regulation of accounting, and consolidation of roads, are particular phases designed to secure results under one or more of the above heads.

There is no evidence that any one of these objects of regulation will ever cease to exist, and it does not now seem likely that any new ones will arise. It should be noted that *all of these points would still exist and constitute problems if the railways were owned and operated by the government.* To the author it seems probable that under "government ownership" the problems arising under some of the heads would be even more acute than they now are under private operation.

Methods of Railway Regulation.—Properly speaking, "railway regulation" implies that the railways are privately operated and subject to regulation by the government. We shall, however, briefly outline the various methods of dealing with the railway problem, including government ownership and operation.

Conceivably, railways might be left entirely to private ownership and operation without any regulation. This would be one extreme. The other extreme lies in complete government ownership and operation. Between the two extremes lie various possibilities. We have tried leaving the railways in the hands of private operators, subjecting them to a minimum amount of regulation. We have gone further and introduced an increasing amount of regulation, to such an extent that it is doubtful if sufficient initiative remains with the private operators. Regulation may go even further in comprehensiveness and detail, reaching a point at which private capital and initiative would no longer care to function in the railway business.

In a majority of nations government ownership and operation have been tried and are now in existence. In some cases the railways have been owned by the government and operated by private persons, as in Mexico. In other cases, the railway properties have been owned by private persons and operated by the government, as formerly in Italy. Again, a combination of government and private railways has been tried as in Belgium and France, where some lines are owned and operated by private capital and others by the government. Finally, we find complete ownership and operation of all railways by the government, as in Germany and Australia.

It is impossible here to discuss these various schemes. It may fairly be stated that unregulated private operation has been found impossible and that experience does not seem to justify such combinations as private ownership and government operation or government ownership and private operation, nor the concurrent operation of public and private lines. In short, the choice lies between a rather completely regulated system of private ownership and operation and a system of complete government ownership and operation. This issue will be briefly discussed after an account has been given of the attempt of the United States to deal with the problem by regulation.

Administrative vs. Judicial Control.—A few years ago, it was important to point out that there are two methods of applying regulation to railways or other industries—the judicial and administrative.[3] "Judicial control," according to which laws are passed and individuals are left to secure their rights through action in the courts, has now been largely abandoned. It proved too uncertain and inflexible, and was unsatisfactory in that it attempted to apply remedies to evil results rather than to prevent them. "Administrative control" is now the accepted means. It is generally applied through commissions or other expert bodies which have a mixture of executive, judicial, and legislative power. Such a body is our Interstate Commerce Commission.

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[3] See Haney, *Business Organization and Combination*, page 385.

The Interstate Commerce Commission.—This Commission consists of eleven men appointed by the President, by and with the consent of the Senate. Though not required by law, it has been usual to appoint men who have more or less skill in railway affairs. As the Commission is at present constituted, a majority of the members have served on state railway commissions. Until recently, two members were professional economists. The salary of a Commissioner is $12,000 per annum. The members of the Commission choose a chairman who holds office for one year. There is a permanent secretary who performs the duties which usually pertain to that office and who, under the supervision of the chairman, acts as the administrative officer of the Commission.

The Commission is divided into "Divisions," each division including not less than three members. The Commission may, under the law, refer any of its work to a division and the divisions have power by majority vote to make decisions which have the same effect as if made by the Commission itself, subject to a rehearing by the Commission. Any member of a division who may desire it, may compel the transfer of a case to the full Commission for consideration, and when there is an appeal from a division ruling, the rehearing of the case takes place before the Commission as a whole. Thus there is little danger of decisions which are not in conformity with the opinion of the majority.

Plan of Commission Organization.—The plan of organization of the Commission is set forth in detail in its annual report for 1920. In addition to five "Divisions," there are thirteen "Bureaus" and a number of special "Boards." The functions of these subdivisions of the Commission's form of organization are indicated in the following outline, together with the designation of the head of each bureau. This outline will serve to indicate the relation between the bureaus, the divisions, and the Commission as a whole.

INTERSTATE COMMERCE COMMISSION	Div. 1. MANAGEMENT AND SAFETY	Bureau of Safety (hours and safety appliances)	Chief
		Bureau of Locomotive Inspection	Chief Inspector
		Bureau of Valuation	Director
	Div. 2. RATES	Bureau of Traffic	Director
		Tariffs Board Released Rates Board Suspension Board Fourth Section Board	Chiefs
		Bureau of Informal Cases	Chief
		Board of Reference	
	Div. 3. RATES AND SERVICE (formal complaints not argued orally)	Bureau of Inquiry (investigation of alleged criminal violations)	Chief
	Div. 4. MANAGEMENT	Bureau of Finance (securities, convenience and necessity, loans)	Director
		Board of Compensation	
		Bureaus of Accounts and Statistics (in part)	
	Div. 5. SERVICE (includes priorities, joint use of terminals, physical connections, etc.	Bureau of Service (car service, and transportation of explosives)	Director
	COMMISSION as a whole	Bureau of Formal Cases	Chief Examiner
		Bureau of Law	Chief Counsel
		Bureau of Accounts (except Division 4 matters)	Director
		Bureau of Statistics (except Division 4 matters)	Director
		Bureau of Administration	Secretary

Naturally the public most frequently comes in contact with the Commission in connection with traffic and rate matters; consequently, their dealings are generally with the Bureau of Informal Cases, the Bureau of Formal Cases, and the Bureau of Traffic.

Informal Complaints.—Informal cases comprise all those complaints in which there is no hearing and no formal order is issued. Any shipper may write to the Commission complaining of rates or service. One does not have to hire a lawyer. In making informal complaint, it is only necessary to tell the secretary of the Commission exactly what the trouble is. The secretary may request further information, but when the facts are all in, the Commission will state the complaint to the railway concerned and file it on its "informal docket." The carrier is requested to make a written statement covering the case from its point of view. If this statement shows that the original complaint is unfounded, the complainant is so advised. The carrier, however, not infrequently admits that the complaint has merit. It may find that the shipper was overcharged. If so, it makes an application to the Commission for authority to repay the excess charge, and if the Commission finds no objection, it grants the authority to refund. Such authority is necessary in order to prevent rebating under the guise of settlement for overcharges. If the carrier denies the charges set forth in the complaint and determines to fight the case, the Commission so notifies the complainant who may then either drop the matter or file a formal complaint.

Formal Complaints.—Formal cases are those which the carriers choose to defend and which involve a hearing and formal decision. Anyone may file a formal complaint, and it is not necessary that an informal complaint be first submitted. While procedure before the Commission is by no means as formal and technical as in the courts of law, and it is possible to prosecute a case without employing an attorney, the tendency has been towards increased formality, and it is generally desirable to employ a traffic attorney who is skilled in practice before the Commission and who has a favorable record in such practice.

Forms for making formal complaint are furnished by the Commission. When the carrier complained against has replied, which must be done within a fixed time, the complaint is docketed and set for hearing at a place convenient to the parties concerned, generally favoring the shipper. Most minor cases are heard by an examiner. The expenses of the hearing are all paid by the government, and consequently shippers can prosecute claims without "costs."

In 1921 the Commission received informal complaints to the number of 7,811, while during the same year there were 1,487 formal complaints filed. The importance of the informal settlement of complaints is further indicated by the fact that in that year the refunding of rates or fares was ordered in 1,289 cases, and the refunds amounted to over $789,000. In addition 211 cases were dismissed or otherwise disposed of without orders. The Bureau of Informal Cases also handled approximately 91,500 letters, many of which were in the nature of complaints, while others sought general information and informal rulings concerning the rights and obligations of the public and common carriers.

Bureau of Traffic.—The Bureau of Traffic has jurisdiction over all matters dealing directly with the charges for transportation and transmission by freight, passenger, express, pipe line, and telegraph service other than proceedings on the formal docket and complaints handled by the "Bureau of Informal Cases." Its activities are directed towards the adjustment of controversies concerning rates, fares, and classifications, such adjustments being accomplished by correspondence and by informal conferences with shippers and carriers. Among the more important matters dealt with recently have been requests for changes in rates on less than the statutory thirty days' notice, the filing of tariff publications containing changes in rates and ratings, the disposition of requests for the suspension of rate changes, and action on applications for relief from the Fourth Section (the long-and-short haul clause).

Development of Railway Regulation in the United States.—There was practically no general regulation of railways by the federal government prior to 1887, but considerable progress had been made by some of the states. The earliest state regulation is found in the special charters granted to railway corporations, some of which limited earnings, prescribed maximum rates, and prohibited discriminations. The period of general state laws, however, dates from about 1850, and by 1870 most of the states had general laws. About this time, the establishment of state railway commissions became common, although a few had existed in the eastern part of the country at a considerably earlier date.

Under the influence of the so-called Granger movement among the farmers of the Middle West, many of the laws of this period were quite drastic in their regulations, but at least two great results emerged from the experience of the seventies: (1) It was decided that the railways are more than private enterprises—that they are affected with a public interest (*Munn v. Illinois*); and (2) that private capital in railways has a right to a fair return and equal protection of the law (*Smyth v. Ames*).

State Railway Commissions.—About 1908 there were 39 state commissions, of which 35 had mandatory powers. At the present time, all the states but Delaware have some sort of commission empowered to regulate railways, wholly or in part.

In a majority of states the commissions have power to hear and investigate complaints, try cases, require the production of books and papers, and publish findings, decisions, and recommendations. Frequently they are either directed or authorized to make schedules of reasonable rates. Generally they may require reports from the carriers. The tendency is general to give control over technical matters, such as interlocking devices and grade separation. The commissions of the various states are brought together through the National Association of Railway and Utilities Commissioners, which for a number of years has exercised considerable influence. On the whole, this association has shown a tendency to cooperate with the Interstate Commerce Commission.

Relation between State and Interstate Regulation.—It is generally recognized that much of the state regulation as exercised in the past has been a disadvantage. It has been practically impossible to secure uniformity, and the conflict among the states as well as with the federal government has been a serious drawback. This situation has been met in part by the Transportation Act of 1920 which gives the Interstate Commerce Commission superior power over rates and consolidation. The Act provides that when the Interstate Commerce Commission finds that any state rate classification or practice causes any unreasonable advantage or prejudice as between persons or localities in intrastate commerce and those in interstate commerce, or any unreasonable discrimination against interstate commerce, the Interstate Commerce Commission shall prescribe the rate, classification or practice to be observed, and its prescription shall prevail. Moreover, consolidations made in accordance with the Interstate Commerce Commission's Act may be effected, notwithstanding contrary state laws or decisions. In practice, however, the Commission has found it expedient to cooperate with the state commissions, and division of authority in the matter of rates is by no means finally determined.

The Interstate Commerce Act of 1887.—For practical purposes the history of railway regulation by the federal government begins with the Interstate Commerce Act of 1887, the primary purpose of which was to prohibit discriminatory and unreasonable freight rates. To this end, it enacted a "long-and-short haul clause" and forbade local discriminations and pooling. The Interstate Commerce Commission was established with authority to investigate common carriers, and with the duty of keeping itself informed as to the management of their business. The Act of 1887 did not give the Commission rate-making power, a fact which was finally decided by the Supreme Court in 1896.[4]

The next important piece of legislation regulating railways was the Elkins Law of 1903, which provided penalties for rebating and in general developed the machinery for enforcing the Interstate Commerce Law. In 1903 the Commission reported that railway discriminations were rapidly disappearing, partly on account of the new law; but in 1905 it was forced to state that new forms of discrimination for which the law was inadequate were being practiced.

Hepburn Act Increasing the Commission's Power.—Accordingly, in 1906, during the Roosevelt administration, came the so-called Hepburn Act, which increased the size and power of the Interstate Commerce Commission and imposed the penalty of imprisonment as well as fines for failure to observe published tariffs.[5] The application of the Act was greatly extended by including pipe lines, express companies, and sleeping-car companies, under the term "common carrier" and by extending the meaning of "transportation" to cover all vehicles or instruments of shipment, irrespective of ownership, including all services in connection with the receipt, delivery, elevation, ventilation, refrigeration, and storage of property transported. Most notable, however, were the provisions of the Act which empowered the Commission to fix maximum rates and to prescribe the form of railway accounting.

A "commodities clause," which forbade carriers to transport in interstate commerce any commodity except lumber in which they had an interest, direct or indirect, was also included in the Act.

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[4] 162 U. S. 184.

[5] The penalty of imprisonment had been repealed by the Elkins Law.

The Carmack amendment provided that initial carriers were to issue bills of lading and to be liable for damages occurring on connecting lines.

Long-and-Short Haul Clause Strengthened in 1910.— In 1910 came the Mann-Elkins Act. This Act extended the Commission's power to cover telephone, telegraph, and cable companies, and required that schedules of rates between points on any carrier's line and points on all other lines should be printed, filed, and posted. The Commission's power over rates was increased by authorizing it to suspend changes made by the carriers, pending investigation, and the burden of proof was put on the carriers to prove the justice of the proposed changes.

The long-and-short haul clause, which had become almost ineffective through numerous exceptions, was strengthened by striking out the qualifying phrase "under substantially similar circumstances and conditions." Prior to 1910 the inclusion of this phrase had made room for numerous exceptions to the clause, since some difference in conditions could generally be found under which to authorize a departure from the rule that no greater charge should be made for a short haul than for a longer one.

There was little change in the Act to Regulate Commerce between 1910 and 1920.[6] The Panama Canal Act in 1912 gave the Commission jurisdiction over the transportation of property within the United States by rail and water, and the power to order railways to make physical connections with water carriers and to prescribe maximum joint rates over such rail-water lines. The Valuation Act of 1913 directed the Commission to ascertain and report on the values of carriers' properties. Then came the Transportation Act of 1920 which will be described in the following pages of the chapter. In most respects, this Act like those which preceded it, is essentially an amendment to the original Act to Regulate Commerce which was passed in 1887. The law as it now stands, with the various amendments which have been made, is known as the Interstate Commerce Act.

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[6] From a traffic point of view the two "Cummins Acts" of 1915 and 1916 are of importance. The first one made the carriers fully liable for loss of or damage to shipments while in their possession in spite of any contract limiting their liability. The later Act provided for limited liability in cases in which the Commission specifically authorized rates dependent upon agreed valuations. In such cases, liability might be limited to the amount of an agreed or released value of shipments. In 1916, also, the so-called Pomerene Bills of Lading Act was passed, which prescribed the form of contract between shipper and carrier, covering the transportation of goods.

Transportation Act of 1920 a Constructive Piece of Legislation.—The so-called Transportation Act of 1920 fundamentally amended our interstate commerce law and gave to the Interstate Commerce Commission unprecedented powers, not only over railway rates and operation but also over finance and construction. The outstanding fact about the Act is that it was fundamentally constructive. Most of the measures adopted for the regulation of railways in the United States, beginning with the Act to Regulate Commerce of 1887, have been at bottom negative; that is, they have consisted largely of regulatory prohibitions and penalties designed to eliminate unfair and discriminatory rates and practices. The Act of 1920, however, while retaining most of the prohibitions of earlier legislation, contains many positive and constructive features.

Earlier regulation proved inadequate because it depended chiefly upon regulating results rather than causes. It attempted to keep the regulatory body too much aloof from the operation of the railways. It said to the railways, "Raise your funds, build your roads and equipment, hire your labor, arrange your operating and rate schedules, and *then* we will undertake to regulate your rates." The Act of 1920 gives the Commission more power to participate with the railways in establishing the conditions upon which rates and earnings depend. It is practically a recognition of the futility of attempting to deal with results without having adequate power over the conditions which cause results.

The new law undertakes to set up standards which are to be not only a basis for restrictive regulation but also may operate to protect the carriers. For example, it is written that under honest, efficient, and economical operation, the carriers may earn a reasonable return upon their investments; and, again, that the carriers may cooperate or even consolidate when it is deemed to be in the interest of the public.

It is the author's judgment that the Transportation Act of 1920 is a wise and constructive attempt to deal with the railway problem by means of regulating privately owned and operated railways, and that it merits a careful trial of sufficient length to demonstrate conclusively whether or not such an attempt can succeed. If not, an unhappy marriage of politics and business is probable.

Background for the Act.—The immediate background of the Act lay in the inadequate earnings of the railways under the existing rate structure and in the exigencies of war, which made many difficulties more acute, notably the labor problem. In the latter part of the nineteenth century, competition in rates and service was subject to too little regulation, and rates had fallen steadily to a very low level. This is shown by the large mileage which was in the hands of receivers, running as high as 40,000 miles in some years. Clearly, there was too small a margin between expense and income. The discriminatory practices which abounded caused a veritable outburst of regulation, both federal and state, which served to reduce the general level of rates and to harass railway operation and finance by conflicting and ill-considered laws governing capitalization and rates.

Then wages and material costs began to advance. Railway credit was impaired and it became so difficult to sell railway stock that the percentage of bonds and short-term notes increased until it reached dangerous proportions. Several years before 1910 the resort to short-term notes became very common, and as such notes may fall due in unprofitable periods a general and long-continued use of such financial expedients is dangerous.

Rate Advances Demanded by Railways—War Measures.—About 1910 the railways began to demand increases in rates, and it is now apparent that in the case of the Eastern roads at least, these demands were justified. At first, however, such demands were refused and only in 1914 was a small advance of 5% authorized. By 1916 it had become apparent that something had to be done, and during the year 1917 advances of 15% were authorized.

About the same time the war problems connected with transportation arose. In August, 1916, Congress passed an act giving the President power to take possession of our railways, and in the following year the President created a federal Director-General. The railways were taken over by the government under separate contracts made with each one, the terms being based on their several earnings during the three-year period, 1914-1917. A new organization was set up in which competition was practically eliminated. Embargoes on non-essential traffic, control over routing, and pooling of terminals and rolling stock, were put into effect. Wages were increased and rates were advanced materially—25% for freight and 50% for passengers.

It is now pretty generally admitted, however, that it was too late to make hasty repairs of the overstrained transportation machinery. The labor force was seriously impaired, and materials and factories were required for the production of munitions of war.

Conditions at the End of the War.—At the end of the war two great problems naturally confronted the nation with respect to its rail transportation system: (1) the problem of restoring railway credit, and providing the basis of efficient operation and expansion, which had been impaired during the long period of neglect prior to the war; (2) the problem of dealing with the demands of organized labor which had been made more acute than ever by the period of government operation and the hasty and ill-considered concessions made during that period. The problem of an orderly transition to private ownership might be classed as a third and distinct one.

The means adopted in meeting these problems are found in the terms of the Transportation Act of 1920, which are briefly outlined in the following paragraphs.

Chief Provisions of the Transportation Act of 1920.—In the first place, the Act provides for a return of the railways to private operation.[7] The terms of this provision are now history and we need not go into detail here. They were chiefly designed to prevent panic, and to that end they continued the financial support of the government for a reasonable period of time. The machinery for settling disputes was established, and it was recognized that the government was bound to return the roads in as good a condition as when taken over, while the roads were obligated to repay expenditures incurred by the government for capital account.

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[7] Government control of waterways was retained and centered in the Secretary of War.

The Labor Problem.—To meet the labor problem it provides that boards of labor adjustment *may* be established by agreement between the railway companies and their employees, such boards to act as conciliatory bodies with reference to working conditions but not wages. The most important measure in its results was the establishment of the Railroad Labor Board, consisting of nine men—three each from the ranks of labor, management, and the public—with power to pass on all wage disputes and upon appeals from the adjustment boards.[8]

The following paragraph from the Act will be of interest as showing the only standards which were laid down to govern the functioning of the Board:

> On the decision of the Labor Board in respect to wages or salaries and of the Labor Board or an Adjustment Board in respect to working conditions of employees or subordinate officials, carriers shall establish rates of wages and salaries and standards of working conditions which in the opinion of the board are just and reasonable. In determining the justness and reasonableness of such wages and salaries or working conditions the board shall, so far as applicable, take into consideration among other relevant circumstances:
>
> (1) The scale of wages paid for similar kinds of work in other industries;
> (2) The relation between wages and the cost of living;
> (3) The hazards of the employment;
> (4) The training and skill required;
> (5) The degree of responsibility;
> (6) The character and regularity of the employment; and
> (7) Inequalities of increases in wages or of treatment, the result of previous wage orders or adjustments.

The decisions of the Labor Board required the concurrence of at least five of the nine members, and in cases affecting wages at least one representative of the public must concur.

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[8] The Labor Board may upon its own motion hear disputes concerning working conditions if it is of the opinion that they are likely to interrupt commerce substantially.

Full provision was made in the Act for publicity of the Labor Board's ruling, but there its power ceases. The Board could upon its own motion hold hearings for the purpose of determining whether its rulings had been violated and publish its findings in any manner in which it desired, but it could not enforce its rulings by legal action.

Railway Credit.—In order to repair railway credit, the Act provides that the Commission shall fix rates which in the aggregate will yield a fair return upon the total value of the railway's property used in transportation. Since this part of the Act has been subject to much criticism and is likely to be the object of attack, it will be well to consider it a little further.

It will be observed that the Act does not require that each individual railway shall have its rates adjusted so as to yield a fair return on its investment, but only that the carriers as a whole or such rate groups as the Commission may designate will earn a fair aggregate annual net return. Furthermore, it is provided that in determining what constitutes a fair return, "honest, efficient, and economical management and reasonable expenditures for maintenance" are to be taken as a basis. Evidence of a broad, constructive point of view is found in the further provision that due consideration must be given to the transportation needs of the country and the necessity of enlarging railway facilities.

In order to establish an immediate basis the Act provided that during the two years beginning March 1, 1920, the Commission should take 5½% of the aggregate value of railway property used in transportation as a fair return, but it might add a sum not exceeding ½ of 1% to make provision for improvements or equipment chargeable to capital account. This amounts to a recognition of 6% on property value as a reasonable return. At the expiration of the two years (in 1922) the Commission adopted a figure of 5¾%.

It has been frequently argued that the foregoing provision constitutes a guaranteed return on investment, and there has been considerable agitation in favor of repealing it. The measure, however, can hardly be called a guarantee since it merely requires the Commission to establish rates, which as a whole, "as nearly as may be," will produce a fair return. Clearly, if the rates made by the Commission fail to produce such a return the railways have no recourse. Moreover, it is apparent that many individual roads would in any case fail to earn 5¾% on their investments under uniform rates designed to insure that rate of return for the carriers as a whole.

Disposition of Excess Earnings; "Recapture Clause."—Of course, the result of a uniform application of such a provision is obvious. Rates that will yield 5½% to one railway might mean 10% to another and a loss to a third. Accordingly, it is provided that if any carrier earns over 6% on the value of the railway property used in transportation, one-half of such excess shall be placed in a reserve fund to be maintained by the carrier involved and the other half of the excess in a general railroad contingent fund. The railway may draw upon its reserve fund for the purpose of paying dividends, interest on bonds or rent for leased roads. The "General Railroad Contingent Fund" is to be administered by the Commission in the furtherance of the public interest in railway transportation, either by making loans or refunding maturing securities or purchasing equipment for the benefit of carriers whose needs are approved by the Commission after hearing.

Early in 1924, this provision—known as the "recapture clause"—was upheld by the Supreme Court of the United States in a case brought by the Dayton-Goose Creek railway.

The carrier argued that the clause is unconstitutional (taking its property without due process of law). The court replied that it had invested in a business dedicated to the public service; that it was not entitled to more than a fair net operating income on its property devoted to transportation; and that Congress could make such a limitation as the Act contains. This clause may become very important. It cuts both ways: if a railway is never to earn more than a certain maximum percentage it must be given the assurance that it will earn at least a fair minimum return.

Pooling and Consolidation.—With a further object of strengthening the railways and insuring that they may be able to earn similar rates of return upon their properties under a system of uniform rates, important changes were introduced with reference to competition. Especially noteworthy is the provision for the consolidation of railways into a limited number of systems. It is provided that pooling ("division of traffic or earnings") may be practiced with the consent of the Commission whenever it is in the interest of economy or better service, and does not restrain competition unduly. This is a belated recognition of the folly of applying the anti-trust law to the railway business. It will probably not have much effect, as the strong regulation of rates now provided for and the authorization of consolidation have removed much of the need for pooling.

Railways are authorized to acquire control of other roads by lease, stock ownership, or other devices if authorized to do so by the Interstate Commerce Commission, whenever such control is in the public interest.

Plan for General Consolidation into Systems.—The most discussed phase of this general move to recognize that railway competition is different from that which may exist among ordinary industries and trades, is found in the provision that the Commission shall prepare "a plan for the consolidation of the railway properties of the continental United States into a limited number of systems." Congress says that competition shall be preserved as fully as possible, but nevertheless it is recognized that the scheme may profoundly modify competition and reduce it in some cases. In keeping with this provision, the Commission has already suggested a tentative scheme for grouping the railways of the country and has held numerous hearings, looking toward the adoption of its scheme. No power of compulsion, however, is given, and it will probably be years before any very comprehensive results are secured.

Commission Empowered to Name Definite Rates.—The power of the Commission over rates is clearly increased by the Transportation Act of 1920. The Commission is, for the first time, given power to fix minimum as well as maximum rates, or to name a precise rate. It may also determine the apportionment of joint through rates among the participating carriers. Long experience had shown that the power to name maximum rates was not sufficient, as discriminatory or otherwise disturbing rates may come in the shape of undesirable reductions. Rates may be too low as well as too high.

Control over Finance and Construction.—Not the least important of the provisions of the Act are those giving the Commission control over finance and construction. Indeed, the power given to the Commission to control new construction has rather close relation to the matter of consolidation. For clearly, new construction and extensions will not be readily authorized unless they conform to the groupings which the Commission determines upon as being in the public interest. Both the consolidation of existing railways and the construction of new ones have a bearing upon the competitive situation. The Act provides that no railway subject to its provisions shall extend its line or construct a new line or acquire or operate any line until it has obtained from the Commission a certificate that the present or future convenience and necessity of the public require such construction or operation. At the same time, railways are prohibited from abandoning any line until permission has been secured for such action. These words may have considerable significance: the Commission "may attach to the issuance of the certificate such terms and conditions as in its judgment the public convenience and necessity may require." Thus the Commission may be able to bring some pressure to bear upon a railway which refuses to act according to the plan of consolidation which it may finally adopt.

The provisions of the Act concerning capitalization may have a similar significance. No railway can now issue stocks or bonds unless such issues are first approved by the Interstate Commerce Commission. The Act provides that it shall be unlawful for any carrier subject to its terms to issue any stocks, bonds, or other evidence of indebtedness or interest in the carrier unless, after investigation, the Commission shall approve and authorize the issue.[9] The Commission on its part must find that the issue is for some lawful object compatible with the public interest and that it is reasonably necessary and appropriate for that object.

States' Rights Considered.—In order to protect the interest of the states in the capitalization of railways, the law prescribes that the Commission shall give notice of applications for the issuance of securities and file a copy with the governor of each state in which the carrier operates. It is to be hoped that this legislation will lead to greater centralization and uniformity in the control of railway capitalization. In the past, several states have sought to regulate capitalization in a shortsighted way, fixing unattractive terms and requiring that a certain proportion of the funds raised be expended within their boundaries.

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[9] A limited amount of short-term notes, having a maturity of not over two years and not in excess of 5% of the total outstanding amount of securities, is excepted. The Commission must be notified even in this case.

Officers and Directors.—"Interlocking directorates" are prohibited except as authorized by the Commission. That is, it is made unlawful for any person to hold the position of officer or director in more than one carrier unless authorized to do so on due showing that such holding will not injure any public or private interest. It has been conceded by the carriers that no persons should be authorized to serve as officers or directors for two roads which have conflicting interests.

Officers and directors are prohibited from certain kinds of manipulation. Thus, it is unlawful for any officer or director to receive any valuable thing in connection with the negotiation or sale of securities by his company or to participate in making or paying any dividend out of capital. It is an elementary principle of sound finance that dividends are only payable out of earnings, and the provision giving the Commission power to enforce this principle is a desirable step in the direction of purifying railway finance.

Control over Car Service Extended.—Many other provisions of the Act might be touched upon, but this brief sketch of its contents will be closed with a reference to its car service provisions. The term "car service" is expanded to include practically all forms of equipment, including private cars, tank cars, and refrigerator cars. The term includes the use, control, distribution, and exchange of locomotives, cars, and other vehicles used in transportation "including special types of equipment." It is made the duty of every carrier to furnish safe and adequate "car service," and to maintain reasonable rules and practices. The Commission is authorized to require carriers to file their rules and regulations with respect to car service, and it may direct the inclusion of such rules with rate schedules. More than this, the Commission may on complaint or on its own initiative establish regulations and practices with respect to car service, including compensation for locomotives and cars not owned by the carriers, i.e., private equipment. When the Commission is of the opinion that an emergency exists, such as car shortage or congestion, it may suspend existing rules, make directions regarding car service without regard to ownership, including the determination of compensation, and establish priorities and embargoes. It is also specifically provided that it may require joint use of terminals in case of emergency.

These measures give extraordinary power to an administrative body, and such grants have been criticized as dangerous. While it is conceivable that the power might be abused, it is believed that this is improbable and that the measures referred to may have a salutary effect. Recurring periods of car shortage and congestion at terminals are two of the great problems of present-day railway operation.

CHAPTER XXXII

CURRENT PROBLEMS IN GOVERNMENT CONTROL: CONSOLIDATION, LABOR BOARD, GOVERNMENT OWNERSHIP

Probably the two most important problems which exist at the present time are the proposed consolidation of the carriers into groups and the labor problem. The latter concerns the function and powers of the Railroad Labor Board. Accordingly, we shall give special attention to these two subjects.

CONSOLIDATION

The Purposes.—The ultimate purposes of the proposal to consolidate the railways into a number of groups are very broad. In the first place, it is sought by consolidation to make the system of government regulation of privately owned and operated railways more effective. Congress apparently has recognized that the great diversity among railway lines makes satisfactory regulation difficult and seeks to equalize our railways by consolidation. When the roads differ widely in strength, efficiency, and traffic interests, no reasonably uniform treatment can be applied effectively. It is hoped, therefore, that by reducing the number of railway interests and making them more nearly equal, the problem of regulation will be simplified.

In the second place, the purpose is to promote a more evenly balanced competition among the carriers—indeed, to create conditions which will allow competition to persist. It is recognized that the greater the extent to which the force of competition can be counted upon to regulate the railway business, the easier it will be to maintain the advantages of private operation.

The immediate purpose of consolidation is connected with both of the fundamental purposes. On the one hand, by the elimination of "weak roads" it is hoped to make it easier to make uniform rates. On the other hand, it is sought so to equalize the opportunities of the various railway systems in securing traffic that they can compete with one another on more equal terms.

The Causes of "Weak Lines."—As things are at present, some railways do not have access to important points where traffic originates or is interchanged. Others have such roundabout routes that they are continually at a disadvantage in securing traffic. Still others lie in territories where at present there is not sufficient density of traffic to enable profitable operation at rates such as those which prevail in other sections. Again, the financial structures of different carriers are very unequal, with the result that some have much higher fixed charges than others. Some have an unduly large proportion of bonds and notes outstanding; others have too heavy a capitalization; whatever the cause, it is a fact that not a few large and important railway systems are at present fatally handicapped in competition by the financial burden with which they are loaded.

The so-called "weak" lines are those which labor under one or more of the foregoing difficulties. It is a purpose of consolidation to meet the problem of the weak lines by combining them with strong ones, or by putting two weak lines together in such a way as to increase their strength. It is thought that in this way greater uniformity may be secured in the rate structure and that the proportion of our railway net which is in the hands of the receivers may be reduced. In some years, over 40,000 miles of railway are operated by receivers.

Finally, a third purpose which was undoubtedly in the minds of those who passed the consolidation measure was that it would enable greater efficiency in operation, which in turn might lead to a lower general level of rates.

We thus see that the purposes of consolidation are fundamental and far-reaching. If they could be even partially attained, a long step would be taken towards a solution of the railway problem. But, as we shall see, consolidation is no cure-all.

The General Plan of Consolidation.—Very briefly stated, the plan, as at present formulated, provides for consolidating the railways of the country into nineteen great systems.[1]

The general plan is to set up a minimum number of strong, independent systems which will follow as nearly as possible the present trend of traffic. In the northeastern part of the country five Trunk Line systems are proposed, all of which touch New York City on the east and Chicago and St. Louis on the west. All the New England railways are tentatively put into one consolidation, but the alternative of linking the Boston and Maine and the New Haven with different Trunk Lines is considered.

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[1] The 19 systems proposed by the Commission are as follows. These systems follow rather closely the 21 groups suggested by Professor W. Z. Ripley.

1. Pennsylvania.
2. New York Central (to include Western Maryland).
   (Alternative: to include Boston & Maine, Maine Central, and Bangor & Aroostook.)
3. Baltimore & Ohio—Reading (to include Monon and Cincinnati, Indianapolis & Western).
   (Alternative: to include New Haven.)
4. Erie–Lackawanna–Wabash.
5. New York, Chicago & St. Louis (Nickel Plate)—Lehigh Valley (to include Toledo, St. Louis & Western, Lake Erie & Western, Wheeling & Lake Erie, Pittsbugh & West Virginia).
6. Pere Marquette–Ann Arbor (to include Detroit, Toledo & Ironton, and Detroit & Mackinac).
7. New England System: New Haven–Boston & Maine–Maine Central.
   (Alternative: New England–Great Lakes System, to include Lackawanna, Buffalo, Rochester & Pittsburgh, and Delaware & Hudson).
8. Chesapeake & Ohio–Virginian.
9. Norfolk & Western–Toledo & Ohio Central.
10. Southern.
11. Atlantic Coast Line–Louisville & Nashville (to include Richmond, Fredericksburg & Potomac, Norfolk Southern, Atlanta, Birmingham & Atlantic, and Florida East Coast).
12. Illinois Central–Seaboard Air Line (to include Gulf & Ship Island, Tennessee Central, Carolina, Clinchfield & Ohio).
13. Union Pacific–Chicago & North Western–Wabash.
14. Chicago, Burlington & Quincy–Northern Pacific (to include Chicago Great Western, Minneapolis & St. Louis, and Spokane, Portland & Seattle).
15. Chicago, Milwaukee & St. Paul–Great Northern (to include Duluth & Iron Range; Duluth, Messabe & Northern; Butte, Anaconda & Pacific, Spokane, Portland & Seattle).
16. Santa Fe–Colorado & Southern–Rio Grande–Western Pacific.
17. Southern Pacific–Rock Island (to include El Paso & Southwestern, Trinity & Brazos Valley, Midland Valley, Vicksburg, Shreveport, & Pacific, Chicago, Peoria & St. Louis).
18. Frisco–Katy–Cotton Belt (to include in addition to St. Louis–San Francisco, Missouri, Kansas & Texas and St. Louis Southwestern, the Alton, and Louisiana Ry. & Nav. Co).
19. Chicago & Eastern Illinois–Missouri Pacific (to include Kansas City Southern, Kansas City, Mexico & Orient, Texas & Pacific, International Great Northern and Gulf Coast Lines).

In the South, three great U-shaped systems are provided, the chief change being the linking of the Illinois Central with the Seaboard Air Line to make the western arm of the third great U—the others being formed by the Southern and the Atlantic Coast Line–Louisville and Nashville systems.

In the West, the chief feature is the establishment of five pairs of competitive Transcontinental lines, all of which touch Chicago (and all but one, St. Louis), and Kansas City. Los Angeles and Seattle would be reached by three of the groups and San Francisco by two. The most notable change is probably the proposed breaking up of the "Hill group" and combining the Great Northern with the Chicago, Milwaukee, and St. Paul.

Two Southwestern groups are proposed, extending from Chicago through St. Louis to Dallas, Houston, Galveston, and New Orleans. These roads would also be in competition with two of the Transcontinental groups—the Santa Fe and the Southern Pacific–Rock Island.

The Pocahontas roads [2] are left much as at present except that the Virginian Railway is combined with the Chesapeake and Ohio.

Bases for the Consolidation Plan.—The bases for this plan are partly covered in the Transportation Act and have partly been worked out by Professor W. Z. Ripley, who was employed by the Commission to study the matter. In the first place, it is agreed that no one of the consolidated systems should be too large. Each system should be kept within the bounds of efficient administration. None of the proposed systems is larger than the old Pennsylvania or New York Central systems. Among the largest would be the Baltimore and Ohio–Reading, the Erie–Lehigh Valley–Wabash, the Burlington–Northern Pacific, and the Union Pacific–Northwestern groups. As one test of size, an effort has been made to secure some similarity in the number of ton-miles of freight handled by each.

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[2] See page 127*f*.

In the second place, it is recognized that long-established rate-making territories exist. Accordingly, of the several systems, each lies within a single classification territory; but there is no close conformity to smaller rate territories. The Transportation Act reads: "Wherever practicable, the existing routes of commerce and trade shall be maintained."

Some effort, too, has been made to make the proposed consolidations with the least possible dislocation of corporate organization, the idea being to disturb business as little as possible.

The law provides that competition shall be preserved as fully as possible, and accordingly the proposed scheme endeavors to maintain trunk line competition at secondary traffic centers to the greatest possible extent.

Finally, there is the important point that the several consolidated systems should be reasonably equal in earning capacity, as determined by the percentage of earnings on property valuation. This is one of the most important bases for the successful prosecution of a consolidation plan.

Arguments for Consolidation.—The arguments for consolidation have, in part, been implied in the foregoing discussion. They may be briefly stated as follows:

1. Consolidation would simplify government regulation. In making rates, one great difficulty lies in the fact that roads of unequal strength cannot operate successfully under uniform rates. A road with heavy fixed charges and high operating expenses would lose money under a rate structure which would bring large profits to a road which has lower expenses and fixed charges. Also in service matters, such as car supply and terminal facilities, it may be easier to get good results when the inadequately equipped roads are connected up with others which can supply their deficiencies.

It has been argued that consolidation would strengthen regulation by aiding both uniformity and differentiation. At present, there are eighty or ninety separate controlling railway systems, which makes it difficult to adopt uniform policies for the whole country. Reasonably uniform standards are desirable and make effective regulation much easier. It is reasonable to suppose that with only nineteen great systems to deal with, such standards could be more easily attained. On the other hand, it is argued that the establishment of a small number of consolidated systems would enable the Interstate Commerce Commission to establish regional branch offices through which it could deal promptly with local matters, many of which now have to be handled at Washington.

2. The second chief line of argument in favor of consolidation is that it would promote economy in service. It may reasonably be anticipated that with consolidation there would be somewhat less duplication of effort and organization. There could in some cases be more direct routing of freight with less roundabout hauls. The movement of freight in solid through trains might be encouraged and some switching would be eliminated. Of course, there would be less interline accounting.

One of the most important gains, it is urged, would come in the matter of car supply. A larger percentage of the freight cars of the country would be on their "home" lines which would result in much less delay on side tracks and hauling of empty cars, which are inevitable when a large part of the cars in use on any given road belong to other carriers.

All these are important advantages, and, to the extent that consolidation would bring them about, it would tend to reduce railway operating expenses. (It might, however, cause increases in other ways.)

3. One of the purposes of the scheme is to preserve competition by strengthening weak roads and that this desirable result could be secured by consolidation is one of the arguments in its favor. When roads are weak because they do not have access to cheap supplies of fuel, by combining them with roads that have such access they could be strengthened. When roads occupy circuitous routes between the main traffic centers, connecting them with more advantageously located lines would enable them to secure a share of through business on equal terms. By combining overcapitalized roads with those which are conservatively capitalized—if that is possible—a reasonable average burden of capitalization may sometimes, at least, be secured, and the stronger credit of the consolidated group would enable the weaker roads to secure more reasonable fixed charges by refunding operations and substituting stocks for bonds. The elimination of independent weak roads would tend to do away with destructive competition and reduce the mileage of railways in the hands of receivers.

4. It is hoped that a general strengthening of railway credit would result which would enable the carriers to secure the capital required to provide the track, terminal, and equipment facilities needed to handle the expanding business of the nation.

Argument Against the Consolidation Plan—the More Fundamental Objections.—Some of the objections to the consolidation plan are of great weight and all should be carefully considered. There are three kinds of objections or criticisms: some concern the fundamental difficulties of any general plan of consolidation; others point out the shortcomings or limitations of the scheme as a complete remedy; still others merely deal with particular defects in the details of the scheme as outlined by the Commission.

Among the more fundamental objections to consolidation in general are the following:

> 1. Mere consolidation will not remove the *source* of the weakness of many "weak" roads. It would be merely glossing over a bad situation to combine them with strong roads and might be unfair to the latter. There are many causes of weakness, including general overbuilding (as in the Northwest and Southwest), unwise rate reductions or adjustments, inefficient management, lack of access to originating or interchange traffic centers, and overcapitalization. It may even be found that the best way to strengthen some of our weak lines would be to break them up into smaller parts which would be more efficiently adapted to local conditions. What is needed is a careful study of the cause of weakness in each case and the application of a remedy based on that cause.
>
> 2. The plan of forming a small number of equal consolidated groups is too drastic and rigid.
>
> (a) It would not allow for desirable independence of certain "bridge" lines which have as their chief function the connection between the great systems of through transportation.
>
> (b) It would affect adversely some communities.
>
> (c) It would not be wise to apply it uniformly both to old, well-established territories in which the railway net is complete and to newer territories in which trade channels are not thoroughly established.
>
> 3. It would create new problems of management which would be as numerous as those which it might solve. It would

be a disruption of the present efficient supervisory groups and of loyalty in the ranks. It would be difficult to get enough men sufficiently endowed with the qualities of leadership and vision required to direct the proposed great systems.

4. It is pracitically impossible to combine the two ideals of equal competitive strength and equal financial strength. If the systems are to be made primarily on the basis of maintaining equal competition it will hardly be possible at the same time to make them equally strong financially.

Other Objections.—Other objections are less fundamental and more negative. They point out that consolidation, after all, is no panacea. Above all, it will not solve the terminal question. To develop a system of complete coordination of terminals at our great traffic centers, requires cooperation among all railways touching at those centers, and also cooperation among the federal, state, and local governments. This last requirement is notably true at New York. To secure such cooperation, a system of consolidation into a few groups would not suffice. Obviously, too, consolidation does not touch directly the labor problem nor the problem of maladjustment of rates.

Criticism of Particular Groupings.—Numerous objections have been raised to the details of the particular plan of consolidation proposed by the Commission, of which only a few of the more important need be mentioned here.

One type of objection is illustrated by those who oppose the breaking up of the group now composed of the Northern Pacific, the Great Northern, and the Chicago, Burlington and Quincy. This is a long-standing, successful grouping and one which probably allows sufficient competition. The proposed New England group calls forth other objections, such as that it does not provide sufficient competition within New

England and that the operating expenses of all New England roads are so high that if placed in a separate group they would still have to charge higher rates than obtain elsewhere. The Illinois Central objects to being grouped with the Seaboard Air Line, on the ground that the two are competitors and that they do not exchange traffic.

This latter grouping also seems objectionable from the public stand-point. Middlewestern points and northeastern points are in competition for the markets of the Southeast, and market competition is the most important kind of railway competition. It would seem wiser to break up the control of the Louisville and Nashville by the Atlantic Coast Line than to weaken market competition further by consolidating the remaining roads which serve the competing sections independently.

Another type of objection concerns the transcontinental situation. No arrangement is made for a coast-to-coast all-rail system, yet the Southern Pacific is apparently to maintain its water lines from Galveston and New Orleans to New York.

Finally, the author would suggest that it would be logical to provide a north and south system for the Great Plains area which would be comparable with the Illinois Central system in the Mississippi Valley. As the western territory develops it will probably become increasingly important that the territory north and west of Kansas City should have an independent north and south line to connect with the Gulf at Galveston. Market competition requires that St. Louis and Kansas City should have separate carriers to the Gulf.

The New England Grouping.—With further reference to New England, it is the author's opinion that the apparent drift toward consolidating the New England lines without making any of them a part of the Trunk Line groups, is a mistake. The great traffic center of New England is Boston and that city is in competition with New York, Philadelphia, Baltimore, and Norfolk. If New England is to hold her own in commerce and manufactures, it would seem wise to adopt some scheme whereby at least one road which serves Boston would be a part of a strong Trunk Line. This function the Boston and Albany, under the control of the New York Central, does not fill satisfactorily. Perhaps no completely satisfactory solution is possible, since the available Trunk Lines all appear to have as their natural terminals some one of Boston's competitors. It seems unfortunate, however, that the New England ports should be dependent on Canadian carriers for effective competition. Some such scheme as the Commission's "New England–Great Lakes" system, with the Delaware and Hudson as the connecting link between New England and a Trunk Line connection, seems to be the best that has been yet proposed.

Arguments Against Consolidation the Stronger.—On the whole, the arguments against any general scheme of consolidation to be enforced at the present time, appear to be the stronger. It seems highly probable that, while in some cases a weak road might actually be strengthened by consolidation, *there are too many cases in which weakness is due to causes that consolidation would not remove.* It is to be hoped that as the Commission studies further it will modify its scheme in the direction of greater elasticity and that less attention will be given to the ideal of a symmetrical series of groups of equal size. After all, these things are not essential and equal competitive strength does not depend upon them. The objection on the score of management is problematical. When one remembers what was done by Harriman in the course of a few years and considers the efficient organization of the vast and complex Pennsylvania system, one may feel that the difficulties are not insuperable. But there are few Harrimans, and it is likely that a system which is so large that the general officers cannot be in close touch with all parts will suffer in efficiency of management, especially when it operates in different rate territories. Furthermore, there are few such rich territories as that covered by the Pennsylvania lines.

Need of Caution.—As a result of the foregoing analysis of the purposes and plan of the railway consolidation measure and of the conflicting arguments for and against it, a number of conclusions seem to stand out as fairly certain.

The plan is not a cure-all.

The particular plan put forth by the Interstate Commerce Commission is not completely satisfactory and is to be regarded as highly tentative. It is to be hoped that much further study will be given before it is adopted. Judging by its reception thus far, compulsion would be necessary to secure the adoption of this or any general plan. In view of the complexity and magnitude of the matter, great care is needed and it is the part of wisdom to go slow, remembering that terrible confusion would result from a mistake and that it would be very difficult to unscramble an undesirable group.

It is the part of wisdom to give up the idea of symmetry and uniformity in size for a more practical and elastic system. The immediate confusion and disruption of credit which would result from violent disturbance of present arrangement in some cases, would not be sufficiently compensated by the advantages in sight. In other cases, it is desirable to allow the separate existence of relatively small independent carriers which perform a service equally for other systems, as is the case with such lines as the Chicago and Eastern Illinois, and the Richmond, Fredericksburg and Potomac.

In order to sum up the foregoing thoughts, we may formulate some general principles which should govern in the consolidation of the railways in this country. First, a few *negative points*:

1. The size of a system is of no importance. In creating a limited number of systems some may have 20,000 miles of line and others, 1,000, or less. Symmetry is not a source of strength.

2. Weakness among railways is due to a variety of causes, many of which have no connection with consolidation and would not be removed thereby.

3. Rates do not have to be made uniform for large territories. Simplicity in rate regulation is best secured not by making large systems which cover territories with diverse traffic problems but by making smaller groups within which conditions would be more uniform.

4. It should be clearly recognized that there are inconsistent elements in the bases proposed by Congress for consolidation and there should be a logical and courageous facing of the problem. The Commission is directed to preserve existing channels of commerce as far as possible, but we know that it is just those existing channels which may be the source of weakness or absence of competition in certain cases. The same may be said of the injunction not to disturb corporate organization.

On the *positive side*, there are the following conclusions:

1. A wise consolidation policy must recognize the different stages in the development of our railway net and traffic in different parts of the country. A large part of the country is not ready for a consolidation program. The most that should be done is to make an intensive study of the trend of traffic, just as one would do in city planning, to determine the tendencies and the apparently advantageous developments and then guide voluntary consolidation.

2. The bases for sound consolidation lie in the fundamental factors which make for profitable railway operation, namely, efficient management, advantageous routes, and access to adequate sources of originating and interchange traffic. These three things should be considered with reference to each consolidation proposed and unless these essen-

tials can better be provided by consolidation the roads should be left alone.

3. Open bridge and terminal lines are often desirable and consolidation should recognize this by leaving such lines, no matter how short, in an independent position.

4. To facilitate rate regulation a plan for consolidation must carefully consider the different rate structures existing in various rate adjustment territories. By maintaining smaller rate territories it is possible to provide for lines which are and will long be fundamentally weak by local rate adjustments.

5. To preserve competition, consolidation must pay chief attention to commercial or market rivalries among cities and producing areas, and to this end important centers should be served by some carriers which are independent of those serving competing centers.

We must not forget that the United States is a very different country from England, not only in the fact that it is much larger and divided into sections with diverse interests, but also that its transportation system is not so near to completion and final development. England can well compel a consolidation of her railways into groups within a period of three years. It would be better for the United States to move more cautiously. Let the Interstate Commerce Commission develop the best possible scheme in the light of present conditions and deal with future new constructions, extensions, and consolidations in such a way as to tend toward conformity with that scheme, but do not force all the carriers of the country to any rigid grouping of consolidation.

THE RAILWAY LABOR PROBLEM

The Problem.—The railways are public utilities having special obligations to society. The laborers who man the railways, however, retain their private organization and the right to strike, much as do laborers in other kinds of industry. It is in this anomalous situation that a large part of the railway problem lies. In other words, the problem is to secure some means of adjusting wages and working conditions in the railway business which will recognize the paramount interest of society in the economic and continuous functioning of transportation.

By the Transportation Act of 1920, the Railway Labor Board (abolished in May 1926) was established and authorized to investigate and make findings concerning wages and working conditions. The Labor Board, however, had no power to enforce its findings other than through publicity. The purpose in establishing the Board was to settle railway labor disputes by arbitration and publicity. The great failure of the Board which was recorded in the shopmen's strike of 1922, soon led to two questions concerning the adequacy of the existing provisions. First, should the Labor Board be kept as a separate organization apart from the Interstate Commerce Commission? Second, should it, or some other body, be given greater powers of compulsion?

Relation of Labor Board to Interstate Commerce Commission.—With reference to the relation between the Board and the Interstate Commerce Commission, it soon became evident that the situation was not satisfactory. The Interstate Commerce Commission determines rates and the Labor Board endeavored to determine wages, but wages partly depend upon rates and rates partly depend upon wages. This circularity exists in the nature of the situation and *the question of priority between wage findings and rate findings would exist even if the Interstate Commerce Commission had complete control. (In fact, it exists on any single, unregulated, private, railway.) But under the established organization, the Interstate Commerce Commission has control over so many factors* *in the situation, while the Labor Board had control over so few, that it was not logical to expect the latter to make the final decision on wages.*

In making wages, the demand for transportation must be considered and especially the prospective gross earnings arising from rates and volume of traffic. Allowance must be made for cost of materials and supplies and for the maintenance and replacement of plant and equipment. Then the gross earnings have to be shared among labor, enterprise, and investors; which makes it necessary to consider, respectively, the supply and demand of each class of labor required, of executive ability, and of capital. Now the Interstate Commerce Commission has jurisdiction over most of these matters. It fixes rates and deals with investment valuation, determination of "fair returns," capitalization, construction, and depreciation accounts. These things cover a large part of the process in which wages must be determined, including (1) the joint demand for labor and the other factors of production, and (2) the supply of all the factors other than labor.

Labor Board Not in Position to Determine Wages.— The logical conclusion from this reasoning is, first, the negative one already expressed: that the Labor Board was not in a position to make final determination of wages. It could logically certify to the Commission the facts concerning the *supply* of labor. It could ascertain and report what should constitute a necessary minimum wage based on cost and supply conditions affecting labor. But wages should not be made regardless of demand, which means a consideration of what the traffic will bear and the abundance and requirements of other factors of production, such as enterprise and capital.

It therefore seems, either that the Interstate Commerce Commission should make the final determination of wages or that a third body which would receive data from the Commission and a labor board, should do so. It may have been possible to continue with the old arrangement, but it is certain that under that arrangement there would always be a lack of coordination and an absence of clear-cut functioning which would prevent the best results.

A labor board is desirable and during the experimental stage there was some advantage in having it separate, but it should either be made a bureau of the Interstate Commerce Commission or its findings should be limited to matters of labor cost, supply, and performance, and be certified to the Commission (or some third body) for final decision on wages.

Need of Settling Labor Controversies Without Strikes.—Whatever the arrangement, it seems clear that we must ultimately come to some method of establishing wages and working conditions for railway labor which can be enforced without strikes or lockouts. This may or may not be called compulsory arbitration, but the results aimed at by compulsory arbitration are what we want. We regulate the conduct of railway enterprise and subject the capital and adminstrative ability employed in this industry to numerous restrictions. We control construction, the issuance of securities, interlocking directorates, the investment account, and the return on investment. It therefore seems logical that there should be more regulation of the conditions under which labor functions, for the purpose of insuring cooperation with capital and enterprise and preventing selfish and shortsighted labor policies.

To this end, it is suggested that more power be given to the government, if that be required, and that it be made the duty of the appropriate branch of the government to investigate labor disputes and subpœna witnesses. Reports based on such investigation should be published promptly and a sufficient delay in declaring strikes and lockouts be required to insure due consideration of all angles of the problem. When a vote is taken by a labor organization on declaring a strike, the balloting should be under the supervision of the government (just as the issue of securities and the making of rates are controlled), and every precaution should be taken to insure that the issue is fairly presented to the men and that the vote fairly expresses their opinion. These, and other measures which might be suggested, would allow such individual initiative on the part of labor as is desirable, but would regulate labor activity in view of the fact that it is functioning in a public utility industry.

Giving Labor a Share in Management.—The foregoing suggestions are in accord with allowing labor to participate in management. It seems clear that if cooperation between labor and capital is to amount to anything, labor must share in management. At the very least, labor should have such contact with the executive side of the business of transportation that it would know what are the costs, earnings, and problems of the company with which it is working. This suggestion is purposely left very vague and general, but considerable progress has been made along the line indicated in some industries. It may be noted that some consolidation of railways into larger groups might make it easier to get the cooperation suggested. Such cooperation can only come when the employer and the employee are interested in similar things, as they are when they are parts of the same company. At the present time, however, there are so many different companies that the best results are not possible. Some are wisely and intelligently managed, while others are not. Probably there are not enough wise leaders to go around. Some consolidation, therefore, would insure a community of interest in a single company and would at the same time reduce the companies to so small a number that we might expect uniformly good results.

Adjusting Wages to Cost of Living.—One further suggestion which the author would make is that in the railway business wages should be adjusted according to changes in the cost of living—this for the purpose of eliminating perennial wage disputes. There is nothing original or novel in this suggestion, and its adoption by England makes it now seem more feasible. The main outlines of the idea are that a standard minimum rate of payment be determined upon and that an index of the cost of living be adopted. Every rise or fall of reasonable magnitude in this cost of living index should be reflected in due course in a proportionate change in the rate of wages. No decrease should be made in wages below the standard minimum, however, unless a specially large and continuous decrease in the cost of living index should occur.

In England the statistics of the Ministry of Labor provide data on the cost of living, and, under the provisions of a sliding scale arrangement, for each rise or fall of five full points in the cost of living there would be an increase or decrease of one shilling per week in wages. This arrangement has been in effect for some time and under it wages have been both advanced and reduced.

The scheme seems reasonable. The chief problem would lie in the determination of the standard minimum rate of wages, but that is not insoluble, and thereafter the question of wages would be automatically settled by variations in cost of living. Provision for changing standards of living might be made by authorizing the determination of a new standard minimum wage once every ten years.

Government Ownership

The Two Extremes: Unregulated Private Operation and Government Operation.—There are two extremes possible in the relation between business and government—the business may be left unregulated in the hands of private enterprise, or it may be taken over by the government and operated without the participation of any private enterprise. Both of these extremes have their weaknesses, and the problem in the United States has been to arrive at the golden mean between them.

We need not discuss the shortcomings of unregulated, private enterprise, but it is important to point out that under government ownership and operation we should have the same disadvantages. It is an old saying that "extremes meet," and thoughtful persons have long recognized that extreme individualism and extreme socialism come to pretty much the same thing.

The Extremes Meet.—In the case of railway operation, the extreme type of individualistic operation is illustrated by the classic expression of one of the old railway leaders, "The public be damned." What the railway man meant was that he differed decidedly with that part of the public which did not agree with him. Now, if we were to have complete government operation, it would be found that necessarily the railways would be so conducted as to rates or service that a part of the citizens would not be pleased. Necessarily, the government would resort to a pretty high degree of standardization and uniformity, and necessarily the railways would be run in conformity with the ideas of a controlling group,—not necessarily the majority. This practically amounts to having that group say, "The rest of you be damned," and that might mean very much the same thing as the original expression.

Discriminations under individualistic operation find expression in the unequal treatment of different individuals whose needs or interests are similar. Under the more uniform government operation, we would also find discriminations, arising from the equal treatment of different individuals whose needs or interests are dissimilar. In dealing with the unregulated, private railway corporation, a shipper or a community of shippers may be confronted by selfishness, greed, and arbitrary decisions; in dealing with a government bureau, would not the same individual shipper or community of shippers have an equally unsatisfactory experience in finding that the bureau represented some selfish group in the nation ("the East?" "the West?" farmers? lumber producers? coal mining interests?) and was subject to the red tape which usually hampers the action of authority delegated to governmental departments?

In fact, over against the evils of speculative control by individuals, we may set political control and the influence of temporary political expediency under government ownership; and against the overhasty short-time policy of individual management, we may set the overslow and possibly too-long-time policies of the state. It seems certain that to pass from the extreme of unregulated private operation to the extreme of government operation would lead us far from the golden mean of private initiative harnessed and controlled in the interest of the public.

The Problem Different in This Country.—It is ever to be remembered that our government is different in important respects from most of those in which government ownership has been tried with more or less success. In the *first place*, the territory and diversity of industrial development found within the United States make the problem very difficult from that in Switzerland, or Germany, or Italy. The very magnitude of railway operations here is probably of some importance as a difference, but it is the complexity arising from diversification that is most important.

In the *second place*, our political ideals are different from those in such countries as Germany. There are few countries in which the idea of individual initiative is so dominant as in the United States. Here we seek the common welfare through the intelligent cooperation of individuals, and rely largely on education to develop the basis for such intelligent cooperation. If we cannot rely upon these things in dealing with the railway business, we shall be admitting that our ideals are impracticable.

Our Political Organization Not Suitable for Business Operations.—In the *third place,* our political organization, whatever its merits in other respects, is not adapted to the administration of business enterprise. There is in it too much of what every American knows as "politics." The labor problem would be especially threatening under a regime of government operation, and the fact that labor leaders of a certain type appear to desire such operation is evidence that they see in it opportunities for securing special advantages which may not be consistent with the best interests of society. Under government operation it would be more difficult than ever to hold the balance in sectional and class rate questions, and it is to be emphasized that the rate structure can only be best for the long-run interests of society when it is made on an economic basis. If rates were to be made on the basis of votes instead of on the basis of costs and demand for transportation service, there would be colossal waste and economic loss.

It is said that the National Transcontinental railway in Canada constructed a line extending 200 miles north from Montreal—beyond any settlement sufficient to warrant a railway—for the chief purpose of winning votes in eastern Canada. The cost was something like $150,000 per mile. Other cases of a similar kind are available in Canadian experience with government ownership.

Under government ownership and operation there appears to be nothing that would compel a counting of the costs of building and operating railways. The almighty ballot would take the place of the "almighty dollar." Railways would be built and "improvements" made where there is a majority—perhaps somewhat as post-offices and river improvements are to-day—and there would be little incentive to the reduction of operating expenses, since as costs increase, taxes might be relied upon to make up deficits. Certainly, so long as we have Congresses which deal with matters such as the tariff and the proposed "soldier's bonus" in the manner in which recent Congresses have dealt, there is little hope that we could expect a businesslike management of our railways under government operation.

The Railway Business.—The vital need in our thinking about railways today is a realization that railway transportation is a business and must be conducted on what is meant by a business basis, while at the same time we recognize that the railway business has a public aspect. On the one hand, the railway executives still should make some adjustment in their attitude to show that they have the new conception of their business. They can show this new conception by more frequently *anticipating* the desirability of things which are now forced upon them by regulation. For example, in handling the terminal problem there is a great opportunity for railway executives to show that cooperation is feasible, and the same may be said of car supply.

They have shown that the old competition in rates is not feasible; now let them show that cooperation is.

On the other hand, we, the people, through our representatives, must meet the new spirit on the part of railway executives half way, and, by allowing reasonable rates, make it possible for private initiative to live in the railway business. There is danger that business will be driven out of railway operation and politics step in. The present situation cannot persist if we are to insist on responsibility among railway men while keeping all the power for the government. It is an old and tried principle that power and responsibility must go together. Either we must assume more responsibility for the efficient functioning of the railways, by such means as dealing firmly with railway labor and strengthening railway credit as required, or we shall have to assume through the government the initiative which we now expect from private management. It is to be hoped that our citizens will have sufficient vision to take the former course, and that the intelligent self-interest of private railway owners will lead them to cooperate. It is always desirable in a country such as ours—and it is still possible—to keep railway transportation on a business basis.

APPENDIX A

GLOSSARY OF TRAFFIC AND RATE TERMS[1]

ADVANCED CHARGE. The amount of freight or other charge on a shipment advanced by one transportation line to another, or to the shipper, to be collected from the consignee.

AGENCY TARIFF. A tariff issued by a publishing agent for one or more transportation lines.

AGREED WEIGHT. The weight prescribed by agreement between carrier and shipper for goods shipped in certain packages or in a certain manner.

ALL-RAIL. Entirely by rail transportation.

ANY-QUANTITY RATE. A rate applicable to an article in any quantity.

ARBITRARY. (a) A fixed amount which a transportation line agrees to accept in dividing joint rates. (b) A fixed amount added to or deducted from a rate from one station to make a rate from another station. (c) A fixed amount added to or deducted from a rate to one station to make a rate to another station.

ARRIVAL NOTICE. A notice furnished to consignee of the arrival of freight.

ASTRAY FREIGHT. Freight bearing marks indicating owner and destination, but separated from the waybill.

AVERAGE DEMURRAGE AGREEMENT. An agreement made between a shipper and a transportation line whereby the shipper is debited for the time cars are held for loading or unloading beyond a certain period and credited for the time cars are released by him within a certain period, demurrage charges being assessed by the transportation line, usually at the end of the month, for any outstanding debits.

BARGE. A flat-bottomed boat.

BASING POINT. A point the rates to and from which are used in constructing through rates between other points.

BASING RATE. A rate used only for the purpose of constructing other rates. (See *Proportional Rate.*)

BELT LINE. A short railroad operating within and/or around a city. (See page 490.)

BILLED WEIGHT. The weight shown in waybill and freight bill.

BLANKET RATE. (a) A rate applicable from and/or to a group of points. (b) A special rate applicable on several different articles in a single shipment.

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[1] Compiled from the Freight Traffic Red Book.

Blanket Waybill. A waybill covering two or more consignments of freight.

Break Bulk. To unload and distribute a portion or all of the contents of a car.

Break Bulk Point. A point at which a portion or all of the contents of a car are unloaded and distributed.

Bulk Freight. Freight not in packages or containers.

Carload. The quantity of freight required for the application of a carload rate.

Carload Minimum Weight. The least weight at which a shipment is handled at a carload rate.

Car-Mile. (a) A statistical unit representing the movement of one car one mile. (b) A unit used in comparing freight earnings or expenses —the amount earned from, or the cost of, hauling a car of freight one mile.

Cartage. The charge made for hauling freight on carts, drays, or trucks.

Circuitous Route. An extremely indirect route.

Claim. A demand made upon a transportation line for the payment of a loss sustained through its negligence.

Class Rate. A rate for a class to which articles are assigned in a classification.

Class Tariff. A tariff containing only class rates.

Classification (Freight). A publication containing a list of articles and the classes to which they are assigned for the purpose of applying class rates, together with governing rules and regulations. (See page 267.)

Cleaning in Transit. The stopping of articles, such as peanuts, etc., at a point located between the points of origin and destination to be cleaned.

Combination Rate. A rate made by adding together two or more rates published in different tariffs. (See *Joint Combination Rate.*)

Combination Through Rate. A through rate made by adding together two or more rates published in different tariffs.

Commodity Rate. A rate applicable to an article described or named in the tariff containing the rate.

Commodity Tariff. A tariff containing only commodity rates.

Common Point. A point reached by two or more transportation lines.

Competitive Point. A point at which two or more transportation lines compete for the movement of traffic.

Concealed Damage. A damage to the contents of a package that externally is in good order.

Concealed Loss. A loss from a package bearing no indication of having been opened.

Consignee. The person to whom articles are shipped.

CONSIGNOR. The person by whom articles are shipped.

CONSTRUCTIVE MILEAGE. An arbitrary mileage allowed to a transportation line in dividing joint rates, etc., on a mileage prorate (not the actual mileage).

CONTAINER. Anything in which articles are packed.

DEMURRAGE. A charge made on cars or vessels held by or for consignor or consignee, for loading or unloading, for forwarding directions, or for any other purpose.

DENSITY OF TRAFFIC. The amount of traffic handled per mile within a certain region.

DESTINATION. The place to which a shipment is consigned.

DIFFERENTIAL. The difference established between rates from related points of origin, or to related points of destination, or via different routes between the same points.

DIFFERENTIAL RATE. A rate established via a route from one point to another by deducting a certain amount from, or adding a certain amount to the rate via another route between the same points. (See *Standard Rate.*)

DIFFERENTIAL ROUTE. The line or lines which maintain differential rates.

DISTANCE RATE. A rate that is applicable according to distance.

DIVERSION. A change in the route of a shipment in transit. (See *Reconsignment.*)

DRILLING (CAR). The handling or switching of cars in freight yards.

DUNNAGE. The material used to protect or support freight in or on cars and vessels. (Bracing, false floors, meat racks, sawdust, etc.)

EMBARGO. To restrict or prohibit the acceptance and handling of traffic.

ESTIMATED WEIGHT. The weight specifically stated in tariffs for goods shipped in certain packages, or in a certain manner.

EXCEPTION SHEET. (See *Exceptions to Classification.*)

EXCEPTIONS TO CLASSIFICATION. A publication containing classification ratings and rules different from the classification ratings and rules contained in a major classification.

EXCESS FREIGHT. Freight in excess of quantity waybilled.

FAST FREIGHT LINE. Two or more transportation lines jointly operating through fast-freight schedules.

FAST FREIGHT TRAIN. A freight train which does not stop at all of the stations on its route.

FEEDING IN TRANSIT. The stopping of shipments of livestock, etc., at a point located between the points of origin and destination to be fed and watered.

FERRY CAR. (See *Trap Car.*)

FIXED CHARGES. Charges which do not vary with an increase or decrease in traffic.

FOREIGN CAR. A term used by a transportation line to denote cars belonging to another transportation line.

FORMAL COMPLAINT. (Before I. C. C.) A complaint filed with the Interstate Commerce Commission for investigation and adjudication under formal procedure provided by the rules of the Commission. (See page 529.)

FOURTH SECTION APPLICATION. A petition of a transportation line to the Interstate Commerce Commission for authority to publish charges not in conformity with the Fourth Section of the Act to Regulate Commerce (the "long-and-short haul clause").

FREIGHT BILL. (a) Destination Freight Bill. A bill rendered by a transportation line to consignee, giving a description of the freight, the name of the shipper, point of origin, weight, and amount of charges (if not prepaid). (b) Prepaid Freight Bill. A bill rendered by a transportation line to shipper, giving a description of the freight, the names of consignee and destination, weight, and amount of charges.

FREIGHT CLAIM. A demand upon a carrier for the payment of overcharge or loss or damage sustained by shipper or consignee.

GATEWAY. A point at which freight moving from one territory to another is interchanged between transportation lines.

GONDOLA CAR. An open car with sides and ends, used principally for hauling coal, sand, etc.

GROSS WEIGHT. (a) The weight of an article together with the weight of its container and the material used for packing. (b) As applied to a carload: the weight of a car together with the weight of its entire contents.

INDIVIDUAL TARIFF. A tariff issued by a transportation line in its own name.

INDUSTRIAL CARRIER; INDUSTRIAL LINE; INDUSTRIAL ROAD. A short railroad owned or controlled by one or more of the principal industries served by it. It may be either a common carrier with all the rights and obligations attached thereto, or merely a private carrier or plant facility. Moreover, it may, whether a common carrier or a plant facility, be separately incorporated or operated merely as a department of the operating companies' business.

INFORMAL COMPLAINTS. (Before I. C. C.) (a) A complaint filed with the Interstate Commerce Commission for the purpose of obtaining its permission and authority to remedy the condition complained of, the complainant and defendant being in agreement as to the merits of the complaint. (b) A complaint filed with the Interstate Commerce Commission in a case which may be handled and likely disposed of by the Commission through correspondence with the parties interested. (See *Formal Complaint.*)

INITIAL CARRIER. The transportation line to which a shipment is delivered by the shipper.

INTERCHANGE POINT. A station located between points of origin and destination at which freight in the course of transportation is delivered by one transportation line to another.

INTERCHANGE SWITCHING. The service performed in transferring cars from one transportation line to another as a part of a transportation movement.

INTERCHANGE TRACK. A track on which freight is delivered by one transportation line to another.

INTERLINE. Between two or more transportation lines.

INTERLINE FREIGHT. Freight moving from one point of origin to destination over the lines of two or more transportation lines.

INTERLINE WAYBILL. A waybill covering the movement of freight over two or more transportation lines.

INTERMEDIATE POINT. A point located between two other points which are specially named in a tariff.

INTERSTATE TRAFFIC. Traffic moving from a point in one state to a point in another state; between points in the same state, but passing through another state en route; and between points in the United States and foreign countries.

INTER-TERMINAL SWITCHING. The moving of cars from a place on one transportation line to a place on another, when both places are within the switching limits of the same station or industrial switching district.

INTERVENE. To take action and participate in proceedings that have been instituted by others.

INTRA-PLANT SWITCHING. The moving of cars from one place to another within the yards of a plant or industry.

INTRA-STATE TRAFFIC. Traffic having origin, destination and entire transportation within the same state.

INTRA-TERMINAL SWITCHING. The moving of cars (other than intra-plant switching) from one place to another on the same transportation line within the switching limits of one station or industrial switching district.

ISSUING CARRIER. The carrier by which a tariff is published or bill of lading or other documents are issued.

JOINT COMBINATION RATE. A joint rate which is obtained by adding together two or more factors published in the same tariff. (See *Joint Through Rate.*)

JOINT RATE. A rate applicable from a point located on one transportation line to a point located on another transportation line, made by agreement or arrangement between and published in a single tariff under proper concurrence of all transportation lines over which the rate applies.

Joint Through Rate. A joint rate published as a unit. (See *Joint Combination Rate.*)

Joint Traffic. Traffic moving between stations located on one transportation line and stations located on another transportation line.

Junction Point. (a) A point at which a branch-line track connects with a main-line track. (b) A point at which two or more transportation lines interchange freight over connecting tracks.

Knocked Down. A term denoting that an article is partially or entirely taken apart (not set up).

Known Damage. A damage discovered before or at time of delivery of a shipment.

Known Loss. A loss discovered before or at time of delivery of a shipment.

Less-than-Carload. The quantity of freight less than that required for the application of a carload rate.

Less-than-Carload Rate. A rate applicable to a less than carload shipment.

Lighterage. The charge made for transporting freight on lighters or barges.

Line-Haul. The movement of freight over the tracks of a transportation line from one town or city to another town or city (not a switching service).

Line-Haul Switching. The moving of cars within yard or switching limits of a station, preceding or following a line-haul. (See *Terminal Switching.*)

Local Rate. A rate applying between stations located on the same transportation line.

Local Tariff. A tariff containing rates applicable only between stations located on the same transportation line.

Local Traffic. Traffic moving between stations located on the same transportation line.

Local Train. A train which stops at all stations on its route.

Local Waybill. A waybill covering the movement of freight over a single transportation line.

Long-and-Short Haul Clause. The Fourth Section of the Act to Regulate Commerce prohibits a transportation line from charging more for a shorter than for a longer haul over the same route, except by special permission of the Interstate Commerce Commission, hence the term "long-and-short haul clause."

Marks. Letters, numbers and/or characters placed on a package for purposes of identification.

Memorandum Bill of Lading. The duplicate copy of a bill of lading.

Merchandise Car. A car containing several less-than-carload shipments.

Mileage Rates. Rates applicable according to distance.

Mileage Tariff. A tariff containing rates applicable according to distance.

Milling in Transit. The stopping of grain, lumber, etc., at a point located between the points of origin and destination, for the purpose of milling.

Minimum Carload Weight. The least weight at which a shipment is handled at a carload rate.

Mixed Carload. A carload of different articles in a single consignment.

Overcharge. To charge more than the proper amount according to the published rates of transportation lines.

Package Car. A car loaded with several less-than-carload shipments destined for distant points.

Paper Rate. A published rate under which no traffic moves.

Peddler Car. A car handled by carriers for less-than-carload shipments from one consignor only over a specified route, the shipments being delivered at points along the route direct from the car to the various consignees.

Per Diem Charge. A charge made by one transportation line against another for the use of its cars. The charge is based on a fixed rate per day

Perishable Freight. Freight subject to decay or deterioration.

Private Siding. A side-track owned or leased by an individual or firm.

Proportional Rate. A rate specifically published to be used only as a factor in making a combination through rate. A rate published from New York to Chicago to apply only on traffic destined to points beyond Chicago would be a proportional rate. (See *Basing Rate.*)

Proportional Tariff. A tariff containing only proportional rates.

Publishing Agent. A person authorized by transportation lines to publish tariffs of rates, rules and regulations for their account.

Rail-and-Water. Partly by rail and partly by water transportation.

Rate Basis. A formula of the specific factors or elements which control the making of a rate.

Rate Scale. A table of rates graduated according to distances or zones.

Reconsign. To change the name of consignee and/or destination of a shipment en route. (See *Diversion.*)

Reconsignment. A change in the name of consignee and/or destination of a shipment en route. (See *Diversion.*)

Refining in Transit. The stopping of shipments of sugar, oil, etc., at a point located between the points of origin and destination to be refined.

Reparation. The redress of an injury, or amends for a wrong which has been done.

Seal (Car). A device for fastening or locking the doors of cars.

Shipper's Load and Count. A term denoting that the contents of a car were loaded and counted by the shipper and not checked or verified by the transportation line.

Shipping Order. Instructions of shippers to carrier for forwarding of goods; usually the triplicate copy of the bill of lading.

Side-Track. A short track extending alongside and connecting at both ends with another track.

Spotting (Car). The placing of cars where required to be loaded or unloaded.

Spur-Track. A short track extending out from or alongside, and connecting only at one end with another track.

Standard Rate. A rate established via direct routes from one point to another in relation to which the rates via other routes between the same points are made. (See *Differential Rate.*)

Standard Route. The line or lines which maintain standard rates.

Station Order Car. A car loaded by a shipper with several less than carload shipments destined to different points along the same route, the shipments being loaded in destination order. A *station order car* is placed in a train without its contents being rehandled at the transportation line's terminals at point of shipment. (See *Trap Car.*)

Storage in Transit. The stopping of freight traffic at a point located between the point of origin and destination to be stored and reforwarded at a later date.

Storage Track. A track on which cars are placed when not in service, or when held awaiting disposition.

Supplement (Tariff). A publication containing additions to and/or changes in a tariff.

Switch. (a) A connection between two lines of track to permit cars or trains to pass from one track to the other. (b) To move cars from one place to another within switching limits.

Switching. The moving of cars from one place to another within switching limits.

Tank Car. A car used for transporting liquids in bulk.

Tap Line. A short railroad usually owned or controlled by the industries which it serves and "tapping" (connecting with) a trunk line.

Tare Weight. (a) The weight of a container and the material used for packing. (b) As applied to a carload, the weight of the car exclusive of its contents.

Tariff. A schedule of rates charged by transportation lines, together with governing rules and regulations. (See *Class, Commodity, Joint, Local, and Proportional.*)

Team-Track. A track on which cars are placed for the use of the public in loading or unloading freight.

TERMINAL SWITCHING. The moving of cars originating at and destined to points within yard or switching limits. (See *Line-Haul Switching.*)

THROUGH RATE. A rate applicable through from point of origin to destination. A through rate may be either a joint rate or a combination of two or more rates.

THROUGH TRAIN. A train which does not stop at all stations on its route.

TON-MILE. (a) A statistical unit representing the movement of one ton one mile. (b) A unit used in comparing freight traffic, earnings, or, expenses—the amount earned from, or the cost of, hauling a ton of freight one mile.

TRACE. To follow the movement of a shipment.

TRACER. (a) A request made to a transportation line to trace a shipment for the purpose of expediting its movement or establishing delivery. (b) A request for an answer to a communication, or for advice concerning the status of a subject.

TRACK STORAGE. A charge made on cars held on carrier's tracks for loading or unloading after the expiration of free time allowed. The charge is generally made in addition to demurrage charge.

TRANSIT PRIVILEGE. A service granted on a shipment en route, such as milling, compressing, refining, etc.

TRANSIT RATE. A rate restricted in its application to traffic which has been or will be milled, stored, or otherwise handled in transit.

TRAP CAR. (a) A car loaded by shipper with several less-than-carload shipments destined to different points, to be distributed at the transportation line's terminals a. the point of shipment into other cars for forwarding to their respective destinations. (b) A car loaded with several less-than-carload shipments for one consignee. (See *Station Order Car.*)

TRUNK LINE. A transportation line operating over an extensive territory.

UNDERCHARGE. To charge less than the proper amount.

VENTILATED CAR. A car equipped with openings at top, sides and/or ends to admit air.

WAYBILL. A document prepared by a transportation line at the point of origin of a shipment, showing the point of origin, destination, route, consignor, consignee, description of shipment, and amount charged for the transportation service, and forwarded with the shipment, or direct by mail, to the agent at the transfer point or waybill destination. (See page 440.)

YARDS (FREIGHT). A system of tracks within a certain area used for making up trains, storing cars, loading and unloading freight, etc.

APPENDIX B

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APPENDIX C

PROBLEMS

CHAPTER I—Nature and Importance of Railway Transportation

(For statistical data see *Statistical Abstract of U. S.*)

1. What are the three largest industrial groups in the U. S.? Give figures to prove it.

2. Is it a sound policy to aid any class (such as farmers) by reducing railway rates so that the carriers cannot make a profit?

3. Briefly discuss the relative importance of agriculture and railway transportation as contributing to the wealth and welfare of the nation.

4. How many miles of railway line in your state? Is the mileage increasing or decreasing? How does the number of miles of railway per square mile compare with the average for the U. S.?

5. Briefly discuss the relation between railways and the growth of your town, noting the bearing of each of the five tests of railway efficiency.

6. Can you name any article the price of which is not affected by railway rates?

7. How many dollars did each person in the U. S. on the average pay to railways last year?

8. Secure a blue-print "profile" and a "ballast chart" of some railway entering your town, covering the division of its line in your vicinity, and report what it shows.

9. List all kinds of railway property within your city limits for some line entering your town and roughly estimate the total value of this property. Report if it is in good condition. Is it increasing in value?

10. Upon what mechanical factors does the tractive power of a locomotive depend?

11. Carefully watch the rails as a freight-train passes and report what you see. How does it affect cost of operation?

CHAPTER II—Internal Organization of a Railway

1. Secure from the secretary of some railway company in which you are interested a chart of its organization and compare it with the charts shown in the text. Discuss the differences, showing their significance.

2. What are the titles of the general officers of any one of the railways

which serve your town? Group these officers, according to function, into departments. (See "Official Guide," or "The Pocket List of Railway Officials," published by the Railway Equipment and Publication Co., New York City.)

3. What division officers are there on the division of some railway serving your town, and how are their activities coordinated? Do they report to anyone beside the Division Superintendent?

4. If you wanted to secure a freight rate on a shipment, of what railway officer would you inquire? If you wanted to "trace" a car? To file a "claim"?

5. How long are the local "divisions" of the railway serving your town? What considerations probably determined the length?

6. Construct a complete ideal scheme of the organization for a railway 200 miles long.

7. Trace step by step to the ultimate source the orders under which a station agent works. (Find out from your local station agent what reports he makes and to what officers he makes them.) Is he under the operating or the traffic department?

8. Briefly discuss the relation between the operating department and the traffic department of a railway.

9. Suppose a shipper orders a car of a certain size or type. He goes to the freight solicitor of one road and is told that there are plenty of such cars but one cannot be got for two weeks. He goes to the freight solicitor of another road and is told that while such a car is not immediately available one will be furnished him within 24 hours. What difference in the organization of the two roads probably explains the situation?

10. Discuss the organization problem suggested by the following story. "The General Manager of a St. Paul road—a man of wonderful energy and strong character but of a very explosive temperament—ordered a train dispatcher to send some empty flat cars to Bay View for rails. The train dispatcher answered that he could not as he did not have the cars. The General Manager replied in tones that none of us mistook: 'Do not tell me that you cannot send cars when or where I tell you to,' and he walked out of the office. Needless to say the cars were promptly sent."

11. Should the freight claim agent be subordinate to the general freight agent or should the two be coordinate? Discuss.

12. How can the interests of the superintendent of motive power and the general superintendent in the work of the master mechanic best be provided for?

CHAPTERS III–IV—Railway Operating and Traffic Statistics

1. From the statistics published by the Interstate Commerce Commission (either Statistics of Railways in the U. S. or monthly bulletins, or pre-

ferably both), bring the comparison between the Baltimore and Ohio and the Erie down to date as nearly as possible to see if the condition that obtained in 1917 still prevails.

2. Tabulate the total number of ton-miles of revenue-freight for five or six different railway companies, and in a parallel column tabulate the freight train-miles (both ordinary and light), freight-train locomotive-miles, the total freight train car-miles, and the ton-miles of revenue-freight per loaded car-mile (i.e., the average carload). Compare the roads to determine which makes the best showing, and sum up your work by entering the name of the appropriate road in the blank shown in the following sentence: "The .... railway has the largest number of ton-miles in proportion to locomotive-miles, and in proportion to train-miles (or car-miles)."

3. Make a graph, plotting curves showing the movement of the following items during the last five or ten years: operating ratio, ton-miles per mile of line, ton-miles, freight train-miles, average revenue per ton-mile, and net earnings per mile of line. Do this either for the U. S. or for some railway in which you are interested. Draw conclusions concerning the relation existing among the various items.

4. Ascertain the total number of ton-miles of revenue freight for any two railways in some recent year. Then compare the two roads for the purpose of applying all the tests of ton-mile significance mentioned on page 56,—kind of traffic predominant, average length of haul, proportion of less-than-carload traffic, etc. On this basis report your judgment as to which road should show the higher earnings per ton-mile.

5. Ascertain if the carloadings last month increased more or less than the normal amount. To do this estimate the total for the month by prorating the carloadings of the weeks which may overlap the preceding or following months; then compare the percentage of change from the preceding month with the normal percentages (for tonnage) shown on page 69.

6. "The X Railway has an average carload of 40 tons, and as its trainload averages 300 tons, it will show a density of 10,000,000 ton-miles per mile of line. Of course, practically all its cars are loaded. Naturally its operating ratio is high and we expect it to earn at least $15,000 per mile of line. This would amount to 5% on its investment." Point out at least eight peculiarities, or inconsistencies, or impossibilities, in the foregoing.

7. Estimate the probable net operating income last month of Class I railways of the United States, basing your estimate on the number of cars loaded during that month, and the cars loaded and the net operating income of the preceding month. (1) Assume that the *gross freight* revenue of the roads varies with the carloadings. (2) Assume that operating expenses were the same percentage of gross revenue as obtained in the last reported month. (3) Assume that the difference between "net revenue from

railway operations" and "net operating income" is a sum equal to 7% of the gross "operating revenue." (Data required:—Cars loaded in last calendar month, cars loaded in the preceding month, gross operating revenue in the preceding month, operating ratio in the preceding month.) Estimate monthly car loadings by prorating the figures for the weeks which overlap at the beginning and the end of the month.

CHAPTER V—Railway Accounts, Revenue and Expense

1. Study the annual report of a railway corporation in which you are interested and compare the percentages of the chief items of expense of that railway with the average percentages shown on page 75, and explain the differences which appear.

2. Do the same for the percentages of revenue from the different sources.

3. Make a careful statement of just what the meaning is of "net income" as used in railway accounting, and explain the difference between that item and "net operating revenue."

4. "Traffic expense is only 2.5% of a railway's total expense; therefore the traffic department is of small importance and the study of 'traffic' matters is less important than 'operation.'" Criticize the foregoing statement.

5. Explain carefully the difference between "repairs," "depreciation," and "replacements"; and work out an illustration showing how a railway company might make a maximum expense charge for a given month by juggling charges belonging under the three heads.

6. The A. B. C. Railway uses the same number of freight-cars as the X. Y. Z. Railway, but its car maintenance expense is much lower. What does this probably indicate? What expense item probably balances the difference in the car repair item?

7. What is the difference in nature between "other deferred assets" and "interest and dividends receivable"? If a railway company guarantees dividends on the stock of another company and owns some of that stock, under what head should it carry the dividends due on such stock?

CHAPTERS VI–X—Operating and Traffic Conditions in Various Sections of the United States

1. Bound the three main transportation districts (East, South, West) and determine the total population of each. Ascertain the total miles of railway line in each and compute the average number of miles per 1,000 persons. Which district is the best supplied with track? Now compare the average density of traffic in each and see what light it throws on the answer to the preceding questions.

2. Compare the tonnage of various commodities hauled by roads in

each of the eight groups distinguished by the Interstate Commerce Commission, with the tonnage hauled by the average U. S. railway. (See *Statistics of Railways in the U. S.*)

3. On an outline map showing rivers, indicate all railway crossings on the Ohio, Mississippi, and Missouri Rivers.

4. On a topographical map of the U. S., such as may be found in recent geographies, trace the main Trunk Lines and Transcontinental roads. See if there are possibilities of other routes out of the Mississippi Valley over the Alleghenies or Rockies.

5. With the help of a good map, compare the chief lines of railway in each of the groups according to traffic and operation, as to size of towns and productivity of land served; also water competition. (Census maps show population density and land values by counties.)

6. Compare two representative railways in each group with the average for the U. S. on the basis of the eleven chief statistical units of judgment listed on page 64.

7. Report how physiographic features of each territory have affected the routes taken by the main lines of railway. (Topographical maps shown in recent geographies will help.)

8. As to each group, inquire: Is the traffic of the railways in this section becoming increasingly or decreasingly unbalanced? Why? What can be done to balance the traffic?

CHAPTERS XI–XII—Principles of Rate Making

1. What will the rate be under the following assumption?

Shippers would offer for transportation per year:	Possible rates per 100 lbs.	Railways would supply transportation facilities for handling per year:
6,000,000 tons	25 cents	1,000,000 tons
5,000,000 "	30 "	2,000,000 "
4,000,000 "	35 "	3,000,000 "
3,000,000 "	40 "	4,000,000 "
2,000,000 "	45 "	5,000,000 "
1,000,000 "	50	6,000,000 "

Why can the rate not be higher or lower than the figure you give?

2. One writer says that "to base rates on cost would be an attempt to find one unknown quantity by using another," arguing that unit costs of transportation vary with volume of traffic and that rates affect volume. Discuss the logic of this reasoning.

3. Another writer makes the two following statements:

(*a*) "Cost as a basis for freight rates would hinder all transportation of low-grade freight and prevent any development of long-distance business."

(*b*) "High rates would be reflected in a decline in volume of business only in the case of goods the use of which could easily be lessened."

Examine these statements critically. Are they both strictly true? Can the use of coal, logs, or sand be easily lessened? Show that the two statements are in conflict.

4. "The policy of charging higher rates upon the more valuable commodities is to be commended. The carrier would then secure his gross receipts by taxing the various manufacturers *a certain per cent of the value* of their goods." Criticize the foregoing statement. Show that it gives no definite basis for fixing a particular rate.

5. "Greater attention should be given in rate making to the interests of society. Probably the best way to accomplish this 'socialization' of rates is to extend the taxation principle——to fix rates more largely with reference to the value of the commodities." Criticize.

6. Explain the following statement: "To charge what the traffic will bear under the principle of joint cost is for the public interest; to charge what it will bear under the principle of monopoly is against the public interest."

CHAPTERS XIII–XIV—True Theory of Rates

1. The following figures represent average revenue per ton and per car for various commodities in a recent year. Show that they prove the importance of (*a*) specific value of a commodity, (*b*) substitutes, (*c*) competition among shippers, (*d*) risk, (*e*) special service, (*f*) size of carload, (*g*) volume of traffic, as affecting rates on various commodities.

	Revenue per Ton	Revenue per Car
Wheat	$ 4.82	$193
Corn	4.38	168
Flour	5.20	129
Hay and straw	4.86	60
Tobacco	9.06	100
Cotton	12.42	142
Citrus fruit	31.20	480
Potatoes	9.71	176
Dried fruit	13.23	181
Horses and trucks	8.15	92
Cattle and calves	6.36	73
Hogs	5.85	36
Fresh meat	14.31	184
Eggs	24.49	274
Furniture (new)	18.18	166
Beverages	7.07	133
Wool	16.70	194

Hides and leather	10.46	210
Anthracite coal	2.74	131
Bituminious coal	2.36	120
Iron ore	1.33	69
Clay, sand, etc.	1.03	49
Crude Petroleum	4.84	174
Salt	5.42	140
Logs	.96	29
Lumber	6.69	176
Refined petroleum	6.08	169
Pig iron	2.24	105
Castings and machinery	8.73	172
Automobiles	25.27	201
Canned foods	9.81	276
Base bullion and metal	10.45	462

2. On the basis of what you know of some industry or business, construct a hypothetical scale of demand prices and supply prices to illustrate the discussion on pages 210 and 211-212. Assume some reasonable point of origin and destination. Take into consideration estimated cost of production and merchandising, estimated prices buyers are willing to pay, etc. Ascertain from the local freight agent the actual freight rate from point of origin to destination, and harmonize the rate with your other figures.

3. A writer on transportation makes the following statement: "The value of a transportation service is sometimes defined as the difference between the price of the commodity in question at the point of shipment and the price at the destination. The suggestion is altogether deceptive, for the difference in price itself depends on the transportation charges." Is this statement true? Does it conflict with any statements made in this chapter?

4. How would the situation represented in the diagram on page 225 be affected if the particular traffic in question were "competitive," i.e., if several routes were available?

How would the shape or trend of the curve DD' differ as between flour and oranges? Does this illustrate the effect of difference in elasticity of demand in rates? In the case of which commodity would a reduction in rates be most likely to benefit the railways?

CHAPTER XV—General Level of Rates

1. The original cost of the land owned by the Chicago, Rock Island and Pacific Railway is said to be $14,000,000. The "present value" of that land is estimated at $37,250,000. It would cost the railway over $115,000,000 if it had to go into the market and buy the same land at the present time (its "condemnation value"). Which is the correct figure to use? How would the use of the last figure affect rates? Value of the company's securities? (Take into consideration the fact that the construction of the road caused increased land value. Consider, however, that if rates were

raised to yield a return on the higher values, a location on the road would be less desirable for a shipper.) Is it possible to ascertain the cost of "reproducing" land? Is it a fair objection to say that a condemnation value would be hypothetical and conjectural?

2. If a railway is hauling nothing but coal and was constructed this year for $100,000,000; and if it transports 15,000,000 tons, and its total operating expense is $10,000,000; what is a fair rate per ton? Suppose that the same road develops a fruit traffic, investing $10,000,000 in branches and equipment of all sorts. The fruit traffic is 1,000,000 tons and adds $4,000,000 to operating expenses. Shippers of fruit would be willing to pay $5 per ton. What would now be fair rates on coal and on fruit?

3. Hadley says: "It is now pretty well understood that fixed charges do not directly affect rates," but that prospective traffic and rates are to be taken into consideration before a railway incurs fixed charges. Does this agree with the discussion on pages 235-236 and 255? (Note that fixed charges include depreciation and bond interest.)

4. In 1919 the Interstate Commerce Commission found the tentative minimum valuation of the railways to be $18,900,000,000. Make a rough check of this figure by estimating the value of items in the railways' investment as follows: Miles of track (other than yards and terminals) at $25,000 per mile; number of locomotives at $20,000 each; number of freight-cars at $1,000 each; number of passenger-cars at $10,000 each; and total for terminals and terminal facilities at about 50% of the value of track. Make allowance for materials, supplies, and working capital on some reasonable basis. See balance sheet in *Statistics of Railways in the U. S.*, and on page 77 above.

5. Is it a sound policy to base the valuation of railways for consolidation purposes on the valuations now being made (on the basis of cost of construction)? What is the purpose of the valuation now being made?

CHAPTER XVI—Railway Competition

1. Go through a volume of Interstate Commerce Commission cases or of the *Traffic World* and make a brief report on one or two cases of competition in rates, stating the facts and discussing the nature of competition involved.

2. Does market competition tend to become cutthroat as is the case of competition between parallel lines? Why?

3. With the help of the section headings make a rapid study of the Interstate Commerce Act and list the powers the Commission has over railway freight service.

4. Discuss the need of balance between (1) allowing initiative (as regards service) and (2) preventing discrimination. Which is the more important at the present time?

5. State the danger of allowing carriers by canals and highways to compete with railways.

CHAPTER XVII—Freight Classification and Commodity Rates

1. Fill in an application for change in classification (form in *Freight Traffic Red Book,* page 522) requesting that Auto Top dressing be given a 5th class rating. (See classification of Dressing or Blacking in the Consolidated Classification.)

2. Why are cigarettes rated 2nd class, screen doors 4th class, and wooden single trees 6th class? Give several explanations.

3. The classification lists acetic acid and sulphuric acid as follows:

KIND OF SHIPMENT	SULPHURIC			ACETIC		
	Of.	So.	W'n.	Of.	So.	W'n.
In glass or earthenware packed in barrels or boxes, L.C.L.	1	1	1	1	1	1
In glass or earthenware packed in barrels or boxes, C.L., min. wt. 30,000 lbs.	3	4	4	3	5	4
In carboys, necks projecting, L.C.L.	1	2	1½	1	1	1½
In carboys completely boxed, L.C.L., see Note 1	1	2	1	1	1	1
In carboys, C.L., min. wt. 30,000 lbs., subject to Rule 34	3	4	A	5 min.	4 wt.	4 24,000
In iron or steel barrels, L.C.L.	R26	5	3	3	3	3
In iron or steel barrels, C.L., min. wt. 36,000 lbs	5	6	5	55 min.	5 wt.	A 30,000
In tank cars, C.L., subject to Rule 35	5	6	5	5	5	A

Give some reasons for the differences between the two acids, considering value, use and volume in which shipped. Note minimum weights. Explain the different ratings given the various methods of packing. Can you give any reasons for the differences between Official, Southern, and Western ratings?

4. Make a list of several commodities on which "commodity rates" apply, to or from your station via the chief railway, and discuss the reasons therefor. Suggest any changes that would benefit the town.

CHAPTER XVIII—Carload Provisions and Their Significance

1. Why should shippers not be allowed to pay flat rates of a certain amount per car of a certain size and have the right to put whatever they please in the car?

2. On the basis of the discussion in Chapter XVIII, outline the various ways in which minimum carload provisions affect shippers.

3. What is the need of the Interstate Commerce Commission's provision that the minimum carload requirement be such as to induce efficiency in loading and moving freight?

4. If the 5th class rate from Chicago to New York is 57 cents per 100 lbs., and the 3rd class rate is 95 cents, what would be the charge for a shipment (in crates) of cast iron Chimney Flue Smoke Deflectors weighing 50,000 lbs? The carrier furnishes two cars of 40,000 lbs. capacity each. (Consult the Consolidated Classification, and read Rule 24 carefully.)

5. Briefly discuss the fairness of basing mixed carload rates on the highest rated article in the car.

6. From the summary of Freight Commodity Statistics of Class I Roads (for a year or for a quarter) as published by the Interstate Commerce Commission, determine what kind of commodity gives the heaviest and what kind the lightest average carload. (Divide number of carloads into number of tons of revenue freight *originating* on respondents' roads.)

7. (*a*) Determine from the same source what the average carload was, and (*b*) compare the average for all carload traffic with the average for all L.C.L. traffic.

CHAPTER XIX—Tariffs and Routing

1. What is a joint through combination proportional class rate? A local joint rate? A local through rate? A local, joint, and proportional tariff? If a commodity moves from A to B on a local rate of 10 cents and from B to C on another local rate of 10 cents, what is the combination rate from A to C? The joint rate? (Be careful in your statement.)

2. (*a*) What is the 6th class rate from Port Jervis, N. Y., to a station taking index number 409? (See Fig. 24a.) (*b*) What is the rate on prepared sizes of anthracite coal from the mines on the New York, Ontario and Western, to Inwood, N. Y.? (See Fig. 24b.) (*c*) What is the 2nd class rate from New Haven, Conn., to Bridgeport, Conn.? (See Figs. 25a and 25b.) (*d*) What is the rate on mill cinder from Bridgeport, Conn., to New Haven? (See Fig. 26.)

3. Ascertain from your local freight agent or other person having tariffs the rate on shoes (N.O.I.B.N.) from the chief source of supply to your town, and find out what you can about the way the rate is made and the kind of tariff that applies.

4. The Interstate Commerce Commission has summed up its findings concerning routing in Conference Ruling No. 214 (*Freight Traffic Red Book*, 1923, page 220). Study this ruling carefully and outline its contents under the following heads: (1) rights of shipper, (2) rights of carrier, (3) duties of shipper, (4) duties of carrier.

5. Determine how many reasonably feasible routes there are between

your town and either Chicago or New York. Try to determine which is the best for a shipment of furniture, L.C.L., assuming the delivery point to be in the center of Manhattan, or in the center of the "Loop District" (if in Chicago). Would your choice differ if the shipment were a carload of fruit?

CHAPTER XX—Chief Rate Territories and Traffic Associations

CHAPTER XXI—Rate Structure in Official Classification Territory

1. Draw a diagram showing how 1st and 5th class rates "taper," under the C. F. A. rate structure, as distance increases. Plot distance on the horizontal scale and the rates on the vertical scale.

2. Assuming rates in Zones A and B of C. F.A. Territory to be as given in the table on page 341, estimate the rate on 5th class goods from Chicago to Grand Rapids. (If you cannot ascertain the exact distance, estimate from the scale on any good map. Study the text carefully.)

3. On an outline map enter the chief towns and railways in C.F.A. Territory, being sure to show all Ohio River Crossings and points mentioned in the text. Also show such zones as are described. Draw red lines between the points mentioned in the section on "Effect of Intrastate Rates."

4. On an outline map enter all points (except Chelsea) mentioned in the section on Trunk Line Association Territory, and the main lines of railways in that territory. Try to indicate by circles the various "rate groups" mentioned.

5. If the 1st class rate from Chicago to New York is $1.42 per 100 lbs., what would be the charge for shipping 500 lbs. of lard in pails from Buffalo to Baltimore? (The shipment would take a Rule 25 rating [see page 278], and the Disque Scale would apply [see page 279]. For the Baltimore differential see page 365.)

CHAPTER XXII—The Chicago–New York Rate Structure

1. Illustrate by diagram, with figures, how the MacGraham Scale led to violations of the long-and-short haul clause.

2. Make a diagram to illustrate how a north-and-south line intersecting two Trunk Lines could play one off against the other and lead to rate cutting. Show by hypothetical rates how it would be necessary to have the transverse line lie in a single rate zone.

3. Figure the 1st class rate to New York from each of the 14 percentage points listed on page 364; estimate or ascertain the distance from the point in each zone which is nearest a railway line between St. Louis and New York; figure the rate per 100 lbs. per mile to each point; plot the results, using a vertical scale of cents and a horizontal base scale of miles. Do you find a "tapering" mileage effect?

4. On the basis of the data in the text, determine 5th class rate from Detroit to Baltimore; from Peoria to Boston. Also figure the 2nd class rate from Philadelphia to Pittsburgh; from Boston to St. Louis.

5. Figure the 1st class rate east and west between Albany, N. Y., and Detroit; the 1st class rate from Baltimore to Buffalo.

6. Is the rate from Albany, N. Y., to Columbus, O., higher or lower than the rate from Columbus to Albany? Why does this situation, which is general between C. F. A. points and interior Trunk Line Territory points, exist? (Consider the kind of traffic moving in the two directions.)

7. Can you find any cities of any importance which appear to be discriminated against by placing them in the same zone with cities from which the distance to New York is greater? Show that any zoning system must result in discrimination, and discuss the question as to how wide a rate zone may be without unreasonable discrimination.

CHAPTER XXIII—Southern Rate Structure

1. On outline maps of the Southern States indicate roughly the approximate areas occupied by the various Mississippi Valley rate groups mentioned on pages 377 and 378. Also indicate the grouping of the Virginia Cities mentioned on page 385. Also draw a line showing approximately where "Southern differential territory" lies. Also show "S. E. territory south of the Walhalla Line." Number each area and attach a brief statement indicating its significance.

2. Draw a diagram to illustrate how the basing point system of rate making means lower rates to the basing points than to other destination points nearer the point of destination.

3. On the basis of the text ascertain: (*a*) the 1st class rate from Richmond, Va., to Baton Rouge, La.; (*b*) the 6th class all rail rate from Boston to Columbus, Miss.; (*c*) estimate the 1st class all rail rate from Pittsburgh to Atlanta via Richmond, Va. (See Chapter XXII on Chicago–New York Rate Structure, and pages 382-384 in Chapter XXIII. Figure the rate as a "combination" on Richmond.)

4. Explain how "blanketing" the rates from the East to destinations in the South avoids departure from the long-and-short haul principle (see page 375).

5. Explain why the Ohio River Crossing cities object to the proposed readjustment of Southern rates.

CHAPTER XXIV—The Transcontinental Rate Structure

1. How important has been the effect of the Panama Canal on the freight of the Transcontinental railways? (Look up the cargo tons going through the canal in U. S. ships in recent years [see *Statistical Abstract*]

and compare the figures with the *tons* of freight hauled by the Union Pacific in the same years [see *Statistics of Railways in the U. S.*])

2. On an outline map of the United States indicate roughly the territory that may be designated as (*a*) Pacific Coast territory, (*b*) Intermountain territory, (*c*) Missouri River territory, (*d*) Middlewest, (*e*) Atlantic coast and eastern interior points. (The areas shown in Fig. 31 will help. See also Fig. 27.)

3. In using the class rates shown in the table on page 405, how can the carriers avoid violating the long-and-short haul clause when the sum of a local rate from a point near the western boundary of a group to a point near the eastern boundary of the next group west plus the rate from the latter point to the coast, is less than the through rate from the former point to the coast?

4. What seems to determine the western boundary of groups A and K? (See pages 135, 373-376.) The eastern boundary of groups G and H? (Study Figs. 18 and 27.)

5. What reasons can you give for the relatively sharp drop in the rates as between group F and groups G and H?

6. Why did the Commission give the "relief" from the long-and-short haul clause which is mentioned on page 402 and no more?

CHAPTER XXV—Export and Import Rates

1. (*a*) Make a list in the order of size of the 10 chief U. S. ports on the basis of the cargo tons of ships of over 500 tons engaged in foreign trade. Use figures from the latest Statistical Abstract of the U. S. (*b*) List them in their order of importance as import points; as export points; and explain difference.

2. On an outline map of the U. S. indicate the location of the 10 chief ports, and draw a line from each one to Chicago. Along these lines write the names of the railway or railways which most nearly coincide.

3. Ascertain and report on the quantities of grain received at various ports, during the last 10 years, and the percentage going to New York. (See *Statistical Abstract of the U. S.*)

4. How much lower is the rate on grain from Chicago to New York by lake and rail than all rail? What percentages are these rates of the total rate from Chicago to Liverpool? (See *Statistical Abstract* under "Freight Rates".)

5. Compare the export and import all-rail differentials on grain with the eastbound and westbound domestic differentials (pages 365 and 415, 424), and list all differences between the two. How do you explain these differences?

6. What is the economic justification for specially low export and import freight rates?

7. Make a general statement of what is meant by the principle of "equalizing" rates, and discuss its advantages and limitations.

8. Is it a sound principle to make widely "blanketed" export and import rates?

9. (*a*) Which is the better way to aid manufacturers in developing export business, to give them an export bounty, or to give them low export freight rates? (*b*) Is it better to protect domestic producers by a tariff or by high freight rates on competitive foreign products?

10. About the middle of 1923 the ocean rates to Europe and Africa from South Atlantic ports were 7.5 cents higher than from North Atlantic ports, and 15 cents higher from Gulf ports. What effect should this have on export and import rail rates? How does your conclusion fit in with the description of the rates given in the text?

11. "The maximum difference in the distances from the West to New York, Philadelphia, and Baltimore is about 61 miles. The New York Central and the Pennsylvania join in rates from Cleveland to New Orleans which are the same as those to Boston, although Boston is 400 miles nearer to Cleveland. Therefore, the granting of the present differentials to Philadelphia and Baltimore is unreasonable." Discuss this argument.

CHAPTER XXVI—The Shipping of Freight

1. May a carrier's tariff provide a higher rate for a shipment not made under the uniform bill of lading? Why? What protection does the Interstate Commerce Commission insure to the shipper in this connection? (See *Freight Traffic Red Book,* index "Bills of Lading" and I.C.C. Conference Ruling No. 160.)

2. If an order bill of lading endorsed by the consignee is lost or stolen, can an innocent purchaser take title to the goods against the owner? Is it negotiable? How does it compare with a promissory note in this respect?

3. Discuss the various topics taken up in Chapter XXVI with some shipper in your city and report his experience. What one of the points does he consider most important?

4. Discuss the justice of the rule making the shipper responsible for inspecting cars and for cleaning or minor repairs.

5. What is the purpose of the stenciled weight of a car in so far as shippers are concerned? Can the stenciled weight be exactly equal to the actual tare weight of the car at all times?

6. Should "tolerance" allowances be used by carriers to modify their liability in claims for loss, e.g., by reducing the quantity of a shortage in weight?

7. Make short lists of (*a*) goods which would be suitable for shipping under "weight agreements" and (*b*) goods which would not be suitable for such agreements.

8. Prepare a short statement illustrating in a more detailed way each of the five advantages of grouping L.C.L. shipments according to a loading guide as described on page 453.

CHAPTER XXVII—Reconsignment and In-Transit Privileges

1. In Conference Ruling No. 72, the Interstate Commerce Commission discusses the reconsignment privilege. Read the ruling and briefly discuss it, stating what is apparently the chief advantage of the privilege to the shipper, and what appears to be the chief danger of abuse.

2. If a carload shipment is ordered to be reconsigned at some point intermediate to the original billed destination, but the carrier fails to effect the reconsignment, (*a*) under what circumstances is the carrier liable, and (*b*) the shipper? What different items of loss may result from failure to divert a shipment?

3. If several L.C.L. shipments billed to several consignees at different points are shipped by a single consignor in a single car which they fill; and if, after the execution of the bill of lading and the departure of the car, the shipper seeks to have the shipments diverted to a single intermediate destination for the purpose of securing a carload rate to that point,—the plan being to distribute the shipments on L.C.L. rates covering the remaining distances—would this arrangement be a legitimate application of the reconsignment privilege? Do the tariffs provide for reconsigning shipments of the kind described? Is a carload of L.C.L. freight from a single shipper a carload shipment?

4. There is a joint through rate on steel plates from Coatesville, Pa., to Fullerton, Pa., and you desire to make a carload shipment from the former point to the latter. There is a temporary embargo at Fullerton, so you start the car and consign it to yourself at Allentown, an intermediate point. Shortly after arrival, the embargo is raised, and you reconsign the car to Fullerton. The railway charges are the sum of the local intermediate rates to and from Allentown plus $6.30 reconsignment charge. Is this correct? Would your answer be different if the car had been placed on a private siding for unloading at Allentown?

5. A railway refuses to establish fabrication-in-transit rates on steel sheets for tanks, although having such rates on steel plates. Plates and sheets (over 16 gauge) are identical. (*a*) Is the refusal unreasonable in itself, and could the transit privilege be compelled on sheets of less than 16 gauge (which are not identical with plates)? (*b*) May the refusal be unduly prejudicial to a tank manufacturer, and on that ground could it be condemned by the Interstate Commerce Commission? (See 63 I. C. C. 363-366.)

6. (*a*) Are the concentration of cotton (of different grades and in uncompressed bales) and compressing it in transit commercially necessary? (*b*) If so, is it desirable that each compress should serve growers from all

directions within a reasonable radius? (*c*) Does this necessarily mean some back-hauling? (*d*) Is a through transit rate justified in such cases? (*e*) Make a rough sketch showing approximate location of New Orleans and St. Louis, and 5 or 6 Mississippi towns at which cotton might be compressed; assume cotton is being compressed at these towns in transit to New Orleans and St. Louis. (*f*) Show by circles how you would adjust rate areas to insure the most economical transportation. (*g*) Would the establishment of limited areas around each transit point and the restriction of the transit privilege on back-haul movements to those areas, help? (*h*) Would a distance or mileage scale of rates within such areas on compressed cotton moving out of the transit points, improve the situation—the mileage rate to be part of the through combination rate which would be lower than the sum of the intermediate rates in and out of the transit points? (See 63 I. C. C. 89-92, for a case of this kind.)

CHAPTER XXVIII—Demurrage and Storage

1. What is the chief purpose of demurrage charges? Of storage charges (other than "track storage")? Are these purposes identical in all respects? What do you conclude concerning the reasonableness of the rule that storage may be as great as the demurrage charge would have been had the shipment remained in the car? Would the storage charges of commercial warehouses necessarily be a test of reasonableness?

2. With your plant being on an "industry track" which is full of cars, if you order a car which the carrier cannot spot, and the carrier's agent gives you written notice of that fact on Saturday at noon, are you liable for demurrage? If so, exactly when would it begin to run?

3. If you order a car placed on a public team track on Friday, and the car is so placed at 1 P. M. on that day, and you load and furnish forwarding instructions by 1 P. M. on Tuesday, do you owe any demurrage? If so, how much?

4. You have purchased a carload of lime, and it arrives Sunday at 8 A. M., no delivery point being specified on the bill of lading. At 10 A. M. Monday the agent mails you an adequate notice which reaches you at 3:30 that afternoon. You then give the carrier notice where to place, which it receives on Tuesday at 3:30, and it places the car at 6 P. M. Wednesday. If, now, a driving rain sets in which lasts until 6 P. M. Friday, with the result that you do not complete unloading till Tuesday afternoon, what demurrage do you have to pay? (Consider when "constructive placement" was made and how many days offset there are on account of carrier's delay, etc.)

5. If you are receiving frequent and regular carload shipments, and three cars are shipped on three successive days, and all three are later placed on your siding on the same day, how much free time do you have? If you unload and release one car in 24 hours, how much free time remains?

If you unload a second within 24 hours, and the third 3 days later at noon, do you have to pay any demurrage?

6. If you have an average demurrage agreement, how much would you have saved in demurrage thereby in the following case: You receive six cars in September, three on the 2nd of the month, one each on the 4th, 15th, and 18th. You release the three cars in 24 hours; the fourth car on the 4th; the fifth car on the 17th; and the last one on the 26th. (Consider rules concerning Sundays and holidays in making your calculations.)

CHAPTER XXIX—Terminal Traffic Facilities and Problems

1. List the terminal facilities and services given by railways in your town, and make a map of the terminals.

2. Are the railway terminals ever congested in your town? If so, at what season? At what hours in the day?

3. What is most needed in your town to remedy congestion at terminals?

4. From the *Statistics of Railways in the U. S.*, try to determine what percentage of the railways' operating expenses are incurred for terminal operations.

5. Investigate and report as definitely as possible just how improved terminal conditions would relieve car shortage.

6. What is the attitude of merchants and manufacturers in your town toward the feasibility of store-door delivery? Container cars? Their reasons?

CHAPTER XXX—Freight Claims

1. Find out from some dealer in clothing and one in furniture, what the chief causes of their loss and damage claims are, and what they do to minimize such claims.

2. Define "Act of God" and list as many conditions which come under this head as you can.

3. If a carrier were to have a train destroyed by reason of a bridge being washed out by a sudden cloudburst, who would be liable for the freight damage caused?

4. Is it possible for a carrier to make a binding contract to free it of all liability for loss or damage due to its negligence?

5. Is a provision in a bill of lading limiting the carrier's liability to a certain sum per 100 lbs. binding? Under what circumstances?

6. After an interstate common carrier has unloaded a shipment in good condition and in due time at its terminal at the destination point, what is its liability? Consider the matter in case the goods are lost or damaged before the consignee has been notified of arrival; whether the loss or damage is due to the carrier's negligence.

7. State the reasons for requiring each one of the supporting documents in cases of concealed loss or damage.

8. Why is it logical to settle claims on the basis of the value of goods at the destination rather than at the point of origin?

CHAPTER XXXI—Public Relations and Regulation

1. Just what difference, if any, would government ownership and operation make in the nature of the 9 points listed on pages 524-525? Which point would be most affected? Which least?

2. Look up all references given under "Interstate Commerce Commission" in the index and classify the activities and powers of the Commission as revealed thereby.

3. Make a brief report on the recent activities of the Interstate Commerce Commission, basing it on a study of the last annual report of the Commission.

4. What powers has the State Commission which deals with railways in your state, and what are its chief activities at present? (See its recent reports.)

5. Look up the successive developments in the long-and-short haul plans of the Interstate Commerce Act and report on what you find.

6. What do you think of the justice of the "recapture clause"? What do you think its economic consequences will be? Especially consider the statement made on page 542, that if net earnings are limited to a maximum it will be necessary also to protect a minimum return. (Prepare a concise statement of your conclusions.)

CHAPTER XXXII—Current Problems in Government Control

1. (*a*) From some such source as the last *Statistics of Railways in the U. S.*, or from current earnings reported in the *Commercial and Financial Chronicle*, or from the prices at which their stocks are selling, pick out a group of five or six railways that can be called "weak." (*b*) Study the operating and traffic statistics of these lines together with their capitalization and fixed charges, to see if you can determine the causes of weakness. (*c*) Would consolidating these lines with any other lines remedy the situation in any case?

2. Read what Dixon, Cunningham, and other writers listed in the biblography have to say about our government operation during the war, and state your conclusions concerning what light it throws on the policy of government ownership and operation of railways.

3. Discuss the logic and practicability of limiting the activities of trade unions of railway laborers, and especially their right to strike.

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